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What of German Industrial Conditions

The Lessons Which Industrial America May Learn in Its Efforts to Prepare for the Competition After the War

BY C. A. TUPPER

THE manufacture of coke in Germany has reached a high level of production, due to the constantly widening demand for it and for its by-products. The latter have been needed in increasing measure for war munitions and supplies; while the iron, steel and foundry trade calls for coke in large quantities, and it is being generally used as a substitute for anthracite.

The Extent to Which Women Have Taken Places of Men Serving in the Army Is Indicated in this View of the Coil Winding Department of the Aligemeine Elektricitäts Gesellschaft, Berlin

As the mining of anthracite serves no essential purpose in the conduct of the war, it has been almost entirely discontinued and the able-bodied men are either serving with the colors or have been diverted to other industries. In fact, coal mining as a whole is seriously hampered by the withdrawal of the more stalwart workers; and this has led to the use of women for all operations in which they can be made of service. When it is remembered that only a comparatively small part of the force of a coal mine is actually employed at the working breasts, it will be seen that for most of the surface operations and to a considerable extent underground there is no difficulty in using female labor. Preference is given, wherever possible, to members of the families of men serving in the army. In both Germany and Austria the laws forbidding employment of women in night shifts have been amended so as to permit it at mines producing coal for government use or for industries serving the government, when sufficient male labor is not available for full capacity. ("Wenn die zur Aufrechterhaltung des vollen Betriebes notwendigen männlichen Arbeitskräfte nicht zu beschaffen

sind.") Operators must be careful to exclude girls who have not yet reached maturity and grown women whose condition will not safely permit hard labor.

THE PROBLEMS IN MEETING PIG-IRON DEMAND

In the supply of coal and coke, the metal industries, railroads and army naval bases are naturally given preference. In fact, nothing is allowed to interfere with the production of the pig iron, ingots, billets, bars, structural shapes, plates, rails, etc., needed for the conduct of the war; while particular attention has been devoted to the promotion of all work connected with the semi-precious and rare metals or substitutes for them.

In the manufacture of pig iron, recourse has had to be made much more than formerly to the lean Lorraine ores; for ingots and foundry castings scrap has been gathered and applied to an extent that would astonish Americans. Importations of Spanish and Italian ores had been considerable before the gateway through the Alps was shut, and Swedish ores arrived in large quantity prior to the activity of British submarines in the Baltic.

The situation has stimulated German ingenuity and thoroughness. This is illustrated in the production of pig iron. At first it was felt that the capacity of each blast furnace would be seriously cut down, with consequent need of building more furnaces; but the leanness of the ore has been largely offset by better methods of charging and control, including more care in laying the furnace burden, the use of specially prepared and concentrated fluxes, more effective drying and preheating of the blast, the introduction of oxygen into the blast, and various elements of control which have improved upon the normal operation of former years. Similar refinements have been introduced into the manufacture of both open-hearth and converter steel; while crucible and electric steel capacities have been pushed to their utmost limits.

DEMAND FOR RAILS AND RAILROAD EQUIPMENT

Aside from the steel used in the production of guns and munitions, concerning which no information is obtainable, the greatest demands upon rolling mills have been for rails and other material used in railroad and bridge construction. Orders upon which any figures have been given out, such as those for the State railroads of Prussia, Saxony, Baden, Hesse, Mecklenburg-Schwerin, etc., represent only a small portion of the whole. The great bulk of the material has gone to the war fronts or the territory immediately behind them (hinterland) in Belgium, France, Russia, Galicia, Serbia, Macedonia and Asia-Minor, where work has been pushed on the Mosul-Bagdad, the Haidar Pasha-Angora, the Alfum-Kara-Hissar-Konia and the Erigli-Bulgurli-Tunnell Adana lines and possibly the Aleppo-Mosul extension connecting the coast with the Bagdad railroad, concerning which there has recently been much mystery. Orders for rails and other track material have been enormous, while the necessity of replacing bridges destroyed by retreating armies has called for more fabricated steel than the works can supply quickly. Meanwhile, wooden structures and pontoons are made to do service.

FREIGHT SITUATION HAS CAUSED SHUTDOWNS

The need for railroad cars for transporting men and freight is also urgent, and the shops available are being pushed way beyond what would formerly have been thought their utmost capacity. Timber is used as far as possible for the bodies; but the demands made upon the metal industries for the iron and steel parts, plates, bolts, couplings, etc., which are irreplaceable otherwise has caused the greatest pressure upon them to get deliveries. Locomotive building is similarly handicapped.

In spite of all that can be done to increase the motive power and rolling stock of the railroads, and particularly to replace equipment worn out or destroyed, the freight situation is very bad. Everything is, of course, subordinated to military necessity, and any industry which is not directly concerned with supplying government needs, whether for Germany, Austria, Bulgaria or Turkey, has to take the "leavings." These are pretty small. In Bohemia and other parts of the two empires where the local feeling is not very loyal, manufacturers, mining companies and others are frankly discriminated against, and many have been compelled to close down.

DISAPPOINTMENT OVER CANAL MANAGEMENT

The situation is to some extent relieved by the use of the great network of canals and rivers; those connected with the Danube and the Elbe have been found of particular value for communication between Germany and Austro-Balkan destinations. But, notwithstanding the great tonnages moved in barges, bitter complaint from shippers has arisen concerning the failure of the canal system to take more of the burden off the railways. Not only is there a great scarcity of barges, but lack of uniformity in depths, sizes of locks, etc., restricts through-journeys to loads of comparatively small cubic contents, and many of the most important links are found to be missing. Furthermore, the present rates for water transportation, with its slow movement, are stated practically to equal railroad rates. The cry is raised that "there has been too much politics and too little practical management" in the administration of the canals and canalized rivers. Also, it is charged that the coke and iron and steel interests, particularly those serving the Krupps, are unduly favored; and there is a demand that the lessons of the war shall be utilized for a more efficient system of utilizing waterways after the war. The following statement from a correspondent in Germany, which was passed unrebuked by the Prussian censor, shows this feeling very clearly:

"Die Westfälische Drahtindustrie ist nun besonders gut daran, durch ihre Ahnlehnung an Krupp, und sie kann es sich schliesslich leisten dass sie einen kostspieligen kanalanschluss ertrag—und nutzlos daliegen hat. Wie aber steht es um andere Unternehmungen, die in einen solche Anlage Kapital hineingesteckt haben, weil die daraus erwartete Frachtersparnis eine Lebensdedingung für ihr Gadeihen ist? Wir halten immer noch an der Hoffnung fest, dass die Lahren des Krieges auch hier Wandel schaffen und dass nach dem Krieg bei den widerstrebenden Parteien wie bei der Regierung eine weitsichtigere Politik hinsichtlich der Wasserstrassen platzgreift." (The Westphalian wire industry is now in an especially good condition because of its relations with Krupp and it can finally assure itself that it has an expensive canal connection readily available. But how is it as regards other undertakings, which have invested capital in such a project, because the saving in freight expected therefrom is an essential condition for their success and growth? We continue to hold fast to the hope that the lessons of the war will effect changes here, and that after the war, as a result of the strifes of parties and the Government, a far seeing policy covering the waterways will result.)

Considering all that has been said in this country about the German system of intercommunicating waterways, the foregoing should be of especial interest to Americans. The writer himself felt, after quite a detailed inspection of that system, that it left practically nothing to be desired. Evidently, however, more than the mere digging and locking of canals is necessary to make them of the utmost service in emergencies such as the war has brought to Germany. An administration divorced from

politics and equal to that of the most efficient railway management is essential to the effective utilization of waterways for transportation. Nor, as the same correspondent points out, should they be mere feeders for railroads. Trunk lines of canals between important points or connecting navigable streams are just as much a necessity as trunk lines of railways. In Germany, for example, the great central canal is not yet in operation, not to speak of its extension to the Elbe (von dem Weiterbau bis zur Elbe ganz zu schweigen), and the lack of this cross-country link has been severely felt.

AUTOGENOUS WELDING FOR REPAIRING WAR EQUIPMENT

One interesting development during the war has been the greatly extended use of autogenous welding. This has proved of the utmost value in making repairs of equipment used for military purposes at or behind the front, particularly in the case of motor trucks and locomotive or car parts. In Poland, especially, the hard usage consequent upon the terrible roads and roadbeds would have kept a great deal of equipment out of service for indefinite periods had it not been for the quick repairs made with welding outfits. Some of the work done upon cylinders, for example, has involved cutting away a part of the wall or head to get at an interior fracture, and then building up and welding the sections in place.

Of scarcely less value has been the use of similar outfits for cutting up the wreckage of steel bridges blown by retreating armies into badly tangled masses of structural material. Not only are these quickly cut away, for replacing with new bridges, but the steel is carefully cut into sections small enough for handling in cars or carts and sent back into Germany to be used as scrap in the furnaces.

HOW THE ELECTRICAL INDUSTRY FARED

The great electrical industries have had, during the war, a varied and checkered career. Not much demand was made upon them for apparatus to be used at the army fronts, for the reason that an enormous supply of everything needful had been stored for the emergency. Private enterprises, also, came to an almost complete standstill, and restrictions put upon the use of copper made it uncertain just how far manufacturers could go in meeting the needs of power companies, electric railroad lines and industrial plants when something approaching normal conditions was again restored. Hence a prearranged plan of turning the electrical plants to the manufacture of shells, shell bands, time fuses, etc., was put into effect without hesitation. This work was organized on a unit system independent of the regular work of each plant, so that equipment not applicable to it was maintained intact and ready for further service as required.

Gradually electrical manufacturers have been resuming production in their customary lines, and a certain part of the production of munitions which they had undertaken has meanwhile been diverted to shops organized for the purpose since the war began. This movement was accelerated by the great demand for electrical machinery with which to equip hydroelectric plants and factories for the fixation of nitrogen from the atmosphere and utilization of the resulting nitrates in the production of explosives. Waterpowers throughout Germany and Austria which had hitherto been undeveloped were sought out and harnessed for this purpose, and a great deal of similar work is still to be done. Plans are being perfected for continuing the manufacture of nitrates on a large scale after the war and applying them to the production of fertilizers and other chemical compounds, but from the number of waterpower projects now under development or planned for there will probably be considerable surplus of electric current to apply to the operation of electric lighting and traction systems as well as factories of different kinds. In most cases, also, the waterpower plants are being linked up to the great transmission systems into which electric power houses

Wire Drawing Department of the Allgemeine Elektricitäts Gesellschaft, Berlin

of all kinds feed, and from which different industries draw. Hence the energy of the streams can be utilized at any point where power is needed over a wide area.

THE STIMULUS TO WATER-POWER DEVELOPMENTS

The fact that the war has forced such an extensive development of water powers, including those of broad but lowhead and sluggish rivers, cannot fail to have an important effect upon German manufacturing as a whole and consequently upon German competition with other nations in the ensuing years of peace. Heavy expense for power, due to the high price of fuel, has always been a severe handicap to the Germans, as compared with British and American manufacturers, and were it not for their extraordinary efficiency, they would have found it almost insuperable. Utilization of the waste gas from blast furnaces and coke ovens, together with the liberal use of slack, bone and lignite coal or briquetted dust under boilers, has played a large part in reducing power costs, and there has been great economy in the transmission and application of electric current, ironing out peaks in the load by equalizing supply and demand, but the addition of a large volume of water power will be a great aid in future. The development of many such power sites involved an initial expense so great that capital could not be found to undertake it except under the stimulus of military necessity; hence in this respect, at least, the war has served a good purpose.

PERMANENT PLACES OCCUPIED BY WOMEN

Women, during late years, have found steadily increasing employment in the electrical industries, and for a great deal of the present work they have altogether displaced men. This is also a factor to be reckoned with in future. Women require less compensation and for many duties such as coil winding, taping, soldering and insulating, they do the work better than men. Net costs of manufacturing are thus reduced. It now seems probable that most if not all of these women will retain their positions after the conclusion of peace. The same is true in many lines of light manufacturing, such as cutlery, files, hardware, tinware and sheet metal work of all kinds, stampings and novelties. The rising costs of male labor and lessened opportunity for the exploitation of the so-called "unskilled" class will, therefore, be considerably offset by the increase of female workers. This is a factor which should be taken into consideration when the possibilities of "dumping" German goods on the American and other markets are discussed.

The above notes taken wholly from German sources, as revealed in correspondence, do not disclose any military secrets and will give the enemies of the central powers nothing of value to them in the conduct of the war. They have, however, a most important bearing upon commercial preparedness for the period of bitter competition which will undoubtedly involve all nations after the war. With all of their losses, Germans are learning and applying things which cannot fail to make them more and more resourceful, more efficient and more thorough in an industrial sense. If we are to retain, even in our own markets, the lead given us by great natural advantages, it behooves Americans to make some preparations on our own account.

The furnace of the Berkshire Iron Company, Sheridan, Pa., is to be placed in operation in March, according to press reports. Idle since March, 1913, it is now being repaired.

Tin-Plate Exports Make New Records

Tin-plate exports from the United States are now at a much greater monthly rate than the high record of 1912, while the imports have dwindled to an insignificant total. The following table is taken from Government data showing exports of tin plates, terne plates and taggers for the first 10 months of 1915, or to Nov. 1:

	Pounds
August, 1915	49,142,735
September, 1915	49,886,814
October, 1915	37,906,547
10 months ended Oct. 31, 1915	273,350,414
10 months ended Oct. 31, 1914	113,645,126
10 months ended Oct. 31, 1913	118,544,362
Fiscal year ended June 30, 1912	181,599,366

The average of exports for August, September and October was 45,645,365 lb. per month compared with only 15,158,280 lb. per month in the fiscal year 1912, the high tide of previous exports. To indicate the decided changes in the destination of these exports the following table is given:

To	To Nov. 1, 1915, Lb.	To Nov. 1, 1913, Lb.
Canada	68,018,174	94,113,634
Mexico	7,236,909	2,055,514
Cuba	5,651,240	4,543,266
Argentina	27,146,844	846,561
Brazil	14,476,557	4,214,551
China	36,452,834	1,607,955
British India	16,889,743	62,591
Hongkong	13,843,829	621,207
Japan	14,538,438	509,245
Other countries	69,095,846	9,969,778

The marked increase in exports to Argentina, China and Hongkong, British India, Japan and other countries contrasts with the large decrease in the trade with Canada.

Tin-plate imports were only 33,869 lb. in October and 68,971 lb. in September. The totals for the first 10 months of the past three years were as follows: 1915, 5,007,380 lb.; 1914, 33,187,240 lb.; 1913, 35,251,756 lb. In 1912 imports were 154,566,599 lb. or 12,880,549 lb. per month.

A large proportion of the past year's gain in exports is due to war conditions and is largely at the expense of Great Britain, whose official statistics show the following comparative exports of tin plates:

	Gross Tons	Pounds
10 months ended Oct. 31, 1913	411,764	922,351,360
10 months ended Oct. 31, 1915	312,405	699,787,200

This is a falling off of about 32 per cent in British exports of tin plates. The present British export rate is nearly 70,000,000 lb. per month or about 50 per cent more than that of the United States.

A War Year's Operations of the Krupp Company

The report of the Fried. Krupp Company at Essen, Germany, presented at a recent general meeting, shows that the net profits for the year ended June 30, 1915, amounted to £4,323,000 as compared with £1,695,000 for the previous fiscal year. Including the balance brought forward the total net surplus on June 30, 1915, was £4,792,000 against £2,041,000 on June 30, 1914. The report states that the results were materially influenced by the large requirements of the military and naval administration, so that the deliveries for German account in the last fiscal year were almost two and a half times the amount of the corresponding total turnover, both domestic and for export, in the previous year. The continued growing demands on the capacity of the firm necessitated large extensions to plant. For this purpose it is proposed to call for the unpaid sum of £1,750,000 of the capital increase determined upon in 1913-14. The usual dividend of 12 per cent was distributed on £10,750,000 capital.

The number of workmen employed at Essen alone, according to a newspaper comment on this report, increased from 38,000 in the fiscal year of 1913-14 to 65,000 last year.

The Louden Machinery Company, Fairfield, Iowa, has established a branch house in Chicago, at 1051 West Thirty-fifth Street, with shipping facilities for the surrounding territory.

JOHN A. HILL

Sudden Death of the Publisher of Five Engineering Weeklies

John Alexander Hill, a dominant personality in the technical publishing field, died of heart disease in his automobile on his way to his business offices in New York on Monday morning, Jan. 24. His end is particularly sudden in the light of the recollection of his seemingly limitless energy and his apparently rugged physique; not yet 58 years of age and the head of a towering business which he had been building up in recent years, he was far from being regarded as at the retiring age, either from the standpoint of the industries he was serving or from that of the properties by which these industries were served and of which properties he was the head. Technical journalism loses a stalwart champion of the ideals which have made the modern business and technical press a power in the industrial progress of the nation.

JOHN A. HILL

Mr. Hill's career is a notable example of a successful man who did not find his chosen work early in life. He was 38 years of age before he became a publisher, although for eight years he had been editor of *Locomotive Engineering*. Prior to 1888, when he got his contact with the publishing business, he had owned and operated machine shops and had been a locomotive engineer. The leadership and independence for which he has always been noted, developed early, for he was the half owner of a machinery repair shop in Mazomanie, Wis., before he was 20 years old.

He was born at Sandgate, Vt., February, 1858. Following his brief connection as an employing machinist, he was in 1879 engaged in Colorado in the erection and operation of engines and mining and other machinery, and then for eight years, or until 1888, was identified with the Denver & Rio Grande Railroad, in the motor power department, then as engineer and finally as roundhouse foreman. Following his editorship of *Locomotive Engineering*, he became president of the American Machinist Press in 1896, and in 1902 the Hill Publishing Company, of which he was president, was organized. Meanwhile from 1900 to 1902, he served as mechanical engineer of the General Manifold Company, Franklin, Pa., building and superintending the arrangement of plant, designing special machinery, including continuous manifolding machines and other improvements in printing machinery, especially sheet-fed rotary presses.

As head of the Hill Publishing Company, he printed what are known as the Hill engineering weeklies, namely, the *American Machinist, Power, Engineering and Mining Journal, Engineering News* and *Coal Age*. He was president of the McGraw-Hill Book Company, publisher of scientific books, and he established the Hill Publishing Company of London, of which he was chairman, publishing the European edition of the *American Machinist*, and he established the Deutscher Hill Verlag A.G., of Berlin, publisher of *Maschinenbau*. One of the big monuments to the efforts of his later years is the great building which he erected on Thirty-sixth Street, New York, to house the editorial, business and printing departments of the Hill papers. Not only is this lofty structure a model in respect to the arrangement and equipment for the convenience and economies of the printing and publishing business, but it is conspicuous among New York's industrial buildings in the provisions for the safety, comfort and health of the employees.

The story of Mr. Hill's life is a remarkable illustration of a man winning his way by sheer strength and ability. He was born in the humblest surroundings and with only such education as was afforded by the country schools in the woods of Wisconsin nearly half a century ago. The fact that he early developed a liking for writing is interesting on this account and shows something of the self-preparation which he was unwittingly giving himself for his later work. He was essentially a man of broad human sympathies. He took a fatherly interest in the welfare of his employees and delighted to have them refer to him as "The Old Man," a term to which he indeed gave wide currency in his early writings on experiences in machine shops and locomotive roundhouses. Some of his practical views of life were reflected in these writings, which were published in book form, among them "Stories of the Railroads" and "Jim Skeever's Object Lessons," written largely in the vernacular of the shop and intended to teach in an attractive way certain lessons.

Mr. Hill was vice-president of the Machinery Club, a member of the Engineers' Club of New York City and Railroad Club, Campfire Club and of the American Society of Mechanical Engineers. His widow, Emma Carlisle Hill, to whom he was married in Wisconsin in 1882, and one daughter survive him. He resided at 80 Munn Avenue, East Orange, N. J.

Arrangements have been completed by which the Factory Appliance Company, Illuminating Building, Cleveland, Ohio, will have charge of all American purchases of the Consortium d' Importateurs et Exportatours, the commercial department of the Banque Mutuelle d'Etudie, 8-10 Rue Nouvelle, Paris, France. The New York correspondent of the Banque Mutuelle is the London & Brazilian Bank, Limited. The Consortium d'Importateurs et Exportatours has a listed capital of 2,000,000 francs and is carrying on extensive engineering and development work throughout France. It is particularly interested in machine tools, shafting, belting, steel sections, plates, sheets, galvanized wire, wire fencing, corrugated sheet steel and rolling-mill machinery. Manufacturers desirous of making permanent business connections in France may find it well to communicate with the Factory Appliance Company.

The headquarters of the California Foundrymen's Association, of which Harry F. Davis is secretary, have been moved to the Hobart Building, San Francisco.

New Features in Forge Shop Design

Interesting Plant Recently Built by the Timken-Detroit Axle Company—High Building Permits Crane Runway Above Hammers

Departing in various ways from the usual design and arrangement of plants of this type the Timken-Detroit Axle Company, Detroit, Mich., has recently built a drop forge shop that has many interesting features. The building is of unusual height, being so designed with a view of getting as much light and air as possible and to provide headroom that would permit the carrying out of plans for the installation of a crane runway above the tops of the large hammers.

The plant, including the die room, which adjoins and is a continuation of the forge shop, is 650 ft. long, the forge shop itself being 378 ft. long, 70 ft. wide and 50 ft. to the raised portion of the roof trusses forming the monitor and 54 ft. to the peak of the monitor. Interior building columns are eliminated. The height of the crane runway is 28 ft. A tunnel in which steam and other lines are carried runs the length of the building through the center so that overhead piping is eliminated and the overhead space is left clear for the operation of the crane. A 40-ton Whiting crane with a 5-ton auxiliary spans the shop. The capacity of the crane and the height of its runway permit its use in picking up any part of a hammer up to about 60 tons in weight and in pulling out a broken piston rod and taking these parts to the machine shop for repairs. The crane is also used for setting large dies, thus eliminating a great deal of hand labor. The plant is designed particularly for making drop forgings of all sizes that are used in the company's adjoining plant which is devoted to the manufacture of automobile axles.

The columns of the building structure are 12 x 30 in. and are spaced 18 ft. on centers. The outer walls are practically all of steel sash and glass from the top of the steel lifting doors on the sides 8 ft. from the floor to the roof. There are no curtain walls and the sash are continuous with the exception of the space back of the columns which is of cement tile and steel, to which the sash are bolted. The steel sash were furnished by the Detroit Steel Products Company and swinging sections are provided in all the sash for ventilation.

Instead of placing the trimming presses at the side of the hammers, as is the usual practice, these presses are located behind the hammers near the outer wall with the furnaces at the sides of the hammers. This arrangement was made so that the hammer operators will get more benefit from the fresh air blowing in from outdoors than they would were the furnaces located back of the hammers and between the operators and the sidewalls. This arrangement was also regarded as more convenient in handling heavy pieces of metal which the hammer man swings around from the hammer to the press instead of carrying it to a press located at the side of the hammer. Having the hammers and furnaces on a parallel line also makes it practicable to use a monorail system for handling large forgings. These forgings are handled by a hand-operated trolley on the monorail track that runs along the larger hammers, ranging from 3000 to 7000 lb. in capacity. The hammer equipment consists of 31 steam drop hammers ranging in capacity from 1500 to 7000 lb., of which 22 were built by the Erie Foundry

The Die Room with Its Raised Bay Providing a Runway for the Crane Handling the Large Dies and the Smaller Machine Tools in the Lower Bay at the Left

One End of the Forge Shop Showing Location of the Steam Hammers with the Trimming Presses between Them and the Outer Walls, the Crane Runway above the Hammers, the Entrance to the Tunnel Running under the Adjoining Street and Used for Conveying Forgings to the Manufacturing Plant Across the Street and Die Racks and Large Dies Stored on the Floor at the Right of the Tunnel Entrance

Company and 9 by the Morgan Engineering Company.

On visiting the plant one is impressed not only by the abundance of light and absence of heat and smoke but also by the fact that there is practically no vibration. Under each row of hammers there is a continuous concrete foundation 5 ft. thick and directly under each hammer a 5-ft. cushion of 12 x 12-in. oak timbers bolted together and set up end wise. The hammer bases are set unusually low. The trimming press equipment consists of 28 Bliss, Toledo and Consolidated machines. One-half of the building is floored with concrete and the remainder with creosoted wooden blocks. The roof is of reinforced concrete.

Directly adjoining the forge shop is the steel yard which is served by a 5-ton Whiting crane with a 75-ft. runway. The crane places stock on a truck at a side entrance at one end of the shop. The same crane is used for loading coal into hoppers at the power plant that adjoins the forge shop. In the yard there is a shear house equipped with a 4 x 4-in. Pels shears. Finished forgings are taken on storage battery trucks down an inclined entrance to a tunnel under the street that leads from the side of the forge shop opposite the stock storage yard to the manufacturing plant a short distance away. Finished forgings are placed in 5 x 8-ft. steel pans that are kept behind the hammers and when these pans are loaded they are removed by the overhead crane and placed on the electric trucks. The stock used in the manufacture of the forgings is for the most part 1½ to 3 per cent nickel steel. The cold trimming of small forgings is done on punch presses in the adjoining manufacturing plant. Cleaning, sand blasting, pickling and heat treating are also done in the other building. The small dies are kept in steel racks at one end of the forge shop and the larger ones on the floor of the shop.

The concrete tunnel that runs through the center of the shop is 8 ft. wide and 8 ft. high. This carries the steam, air and fuel oil supply piping and the exhaust steam lines, the last being used for heating the various buildings. Eventually it will be used for operating low-pressure turbines. Live steam is carried in a 12-in. line and the exhaust in a 24-in. line. Branches ranging from 2½ to 4 in. in size run under the floor from the steam main to supply the hammers. Oil burning heating furnaces are used, the blast for the furnaces being supplied by two General Electric blowers with a capacity of 4200 cu. ft. per minute, located at the side of the shop near the center. Air is used at 2-lb. pressure. Scale is blown off the dies while the forgings are made by air supplied by Bury single-stage compressor located in the die room.

A central oiling system located in the engine room is provided for lubricating the hammers. The feed is from a 75-gal. tank, control being with water pressure backed by steam pressure, the system being practically similar to an enlarged steam lubricator. A sight feed lubricator on the steam pipe adjoining the cylinder and controlled by a hand valve supplies the lubricant. The lubricator is connected to a ⅜-in. oil line.

The die room, in which the various dies are made, is 40 ft. wide and a much lower building than the forge shop which it adjoins at one end. On one side of this is a raised crane bay which is served by a 3-ton Whiting crane with a 20-ft. span that is used for handling large dies. The smaller machine tools are located in the lower bay and the larger ones in the crane bay. A Hoskins electric furnace is used for hardening small dies.

The power plant equipment includes six 200-hp. Wickes tubular boilers equipped with Jones underfeed stokers and with high and low water regulators. Other boiler room equipment includes a Cochrane feed-water heater with a V-notch recording device and a Worthington duplex boiler feed pump. The

A Portion of the Power House Showing the Suspended Coal Bunker and the Special Cars Employed for Conveying Coal from the Bunkers to the Mechanical Stokers

coal is stored in overhead bins with curved sides and is discharged through the openings shown into a car which travels on a framework of structural shapes to discharge into the hopper of the underfeed stokers used. In the illustration of the powerhouse interior, one of the cars is shown in the discharging position while the one in the background is in position to receive coal from the overhead bunker. The discharge gates of the bunkers are controlled by the chains passing over pulleys fastened to the side of the bunker. From the chain a bar passing to the discharge gate transmits the power. When it is desired to open one of these gates to fill a car, the portion of the chain to which the bar is not attached is pulled down. This, of course, raises the other portion of the chain, pulling up the bar and causing the gate on one side to open, the motion of this gate being transmitted through a gear segment at its upper end to a corresponding gear on the other gate with which it meshes, thus causing the gate to be entirely opened. When it is desired to shut off the supply of coal, the movement of the bar is in a downward direction, thus forcing the gate to which it is attached toward the closed position, while the other half of the gate is brought in toward the center through the action of the pair of gear segments. A runway is provided as shown along the front of the boilers and the wall of the powerhouse to enable the car and its supporting framework to serve any of the stokers in the boiler room.

The toilet room facilities are very complete. These include, in addition to the toilet rooms, several shower baths and locker rooms with about 100 lockers.

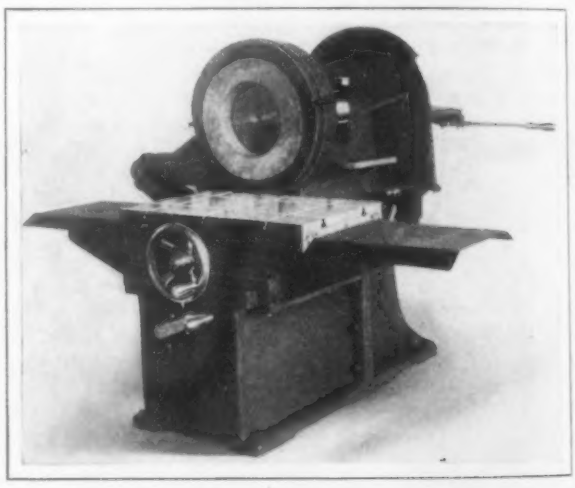
A method of driving home a lesson in fire prevention has been inaugurated by the New Departure Mfg. Company, Bristol, Conn. In accordance with a notice which had been previously posted, the whistle was blown at 11 o'clock, Saturday, Jan. 15, and the power stopped. The 1700 hands immediately began a thorough house cleaning and corners were dug into, all waste material was picked up and placed in the central aisles and the floors were swept and scrubbed. When the task was completed the factory was in the best possible order. Fire Prevention Day will be repeated from time to time.

A Special Two-Wheel Grinding Machine

An adaptation of its standard No. 6 grinding machine has been placed on the market by the Gardner Machine Company, Beloit, Wis. The regular machine is the conventional type double-wheel grinding machine equipped with standard lever feed tables. In the new type the wheel at the left end is of the ring type gripped in a chuck and a table having adjustments at right angles to and along the axis of the machine spindle is provided, while the wheel at the right is an ordinary abrasive disk wheel with a universal lever feed table.

The top of the special work table is 20 in. wide and 30 in. long with T-slots cut in the upper surface for attaching the work or suitable fixtures. A longitudinal travel of 20 in. is obtained by turning the handwheel at the front of the machine and on the shaft of this wheel is a pinion meshing with a rack attached to the under side of the table. This movement provides for the facing of the work as it is traversed past the wheel. To provide for the adjustment of the work a movement of 6 in. toward the wheel is accomplished through a finely threaded screw operated by a crank. This arrangement, it is pointed out, protects the wearing parts from dust and grit. The wheel used with this table is 18 in. in diameter and is of the ring type held in a chuck.

At the other end of the spindle an abrasive disk wheel 26 in. in diameter is mounted and is provided with a universal lever feed table. Dust hoods are furnished for both the disk and ring wheels and are connected to the dust exhauster in the rear of the



A Grinding Machine Equipped with a Ring Wheel and Work Table Having Transverse Movement at One End and a Disk Wheel and Lever Feed Table at the Other

machine. The spindle is 2 in. in diameter and the driving pulley mounted on it is 8 in. in diameter, with a face 8½ in. wide. The equipment furnished with this machine includes a wheel press for attaching new abrasive disks to the steel wheel, a countershaft and the customary extra supplies.

New Centrifugal Pumps for General Service

In addition to the line of centrifugal pumps which it has built for over 20 years for condenser work the Wheeler Condenser & Engineering Company, Carteret, N. J., is now building a line of horizontal and vertical shaft centrifugal pumps for general service. These pumps conform to the most recent advances in centrifugal pump construction, having a two-part divided casing with the suction and discharge nozzles in the lower portion. A closed double-suction type of impeller, protected by labyrinth wearing rings, is used, and the shaft is guarded against the entrance of water by bronze sleeves which screw on the shaft and extend entirely through into the bearing bracket boxes. The bearings, which it is emphasized are of large dimensions and are bolted to the pump casing instead of being cast integral with it, are of the ring oiling type and in the outboard bracket a ring oiling thrust bearing is located.

Storage Battery Elevating Truck

An electric storage battery truck having a geared drive and a platform that may be raised and lowered by electric power has been placed on the market by the Automatic Transportation Company, Buffalo, N. Y. This truck is designed for use in machine shops, manufacturing plants, warehouses, freight terminals and all industries where there is any great amount of trucking. In this system the goods are placed on platforms in various portions of the plant and are moved by the truck, or if so desired, the trucks can also be used for ordinary trucking purposes as they are provided with a platform covering the wheels or as tractors to haul ordinary trailers from place to place. The platforms used with this truck are made of wood or metal and fitted with stakes, hoppers, racks, etc., conforming to the special characteristics of the product that is to be moved.

The truck is constructed of I-beams, steel castings and drop forgings and the wheels have rubber tires. The controller is of the vertical type with three speeds forward and the same number in the opposite direction. A foot pedal brake and automatic safety features such as are found in the company's regular line of trucks one of the earlier types having been illustrated in THE IRON AGE, May 11, 1911, are provided. The truck is equipped with a steel platform entirely covering the lifting planes for regular trucking purposes. The height of this platform from the floor is 10 in.

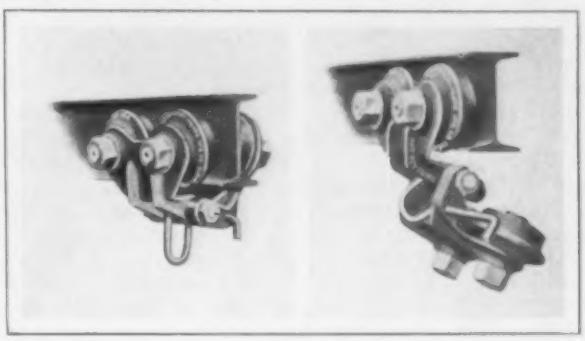
The lifting planes are raised 3 in. with a 4000-lb. load in 7 sec. by a special electric lifting device driven by an individual motor taking power from the truck battery. From the motor the power is transmitted to the planes through a steel worm and phosphor bronze worm gear. The control of the lifting device is automatic and when it is desired to drop the load this can be done in from 3 to 5 sec.

The truck is steered by all four wheels and is controlled by a lever working in either the vertical or horizontal plane at the will of the operator. The turning radius of the truck is less than 6 ft., which, it is emphasized, enables the truck to turn sharp corners and be used in practically any place where a hand truck can.

The truck is driven by a 3-hp. motor, the power being transmitted through cut spur gears to a floating axle. These gears are inclosed in a steel case and run in an oil bath, an arrangement which is relied upon to give the necessary lubrication and insure silent operation. The driving wheels, which are placed underneath the battery, are two in number and 16 in. in diameter. Either Edison or lead batteries, possessing sufficient capacity to operate the truck and elevating platform a full day at a traveling speed of 5 to 7 miles per hour, are used.

A Detachable Form of I-Beam Trolley

A detachable I-beam trolley has been brought out by the Chisholm & Moore Mfg. Company, Cleveland, Ohio. It is designed for use on tracks that have no open end, as it can be quickly placed on a track of this type and is as quickly taken down. A hinge at the bottom of the trolley permits it to be opened so that it

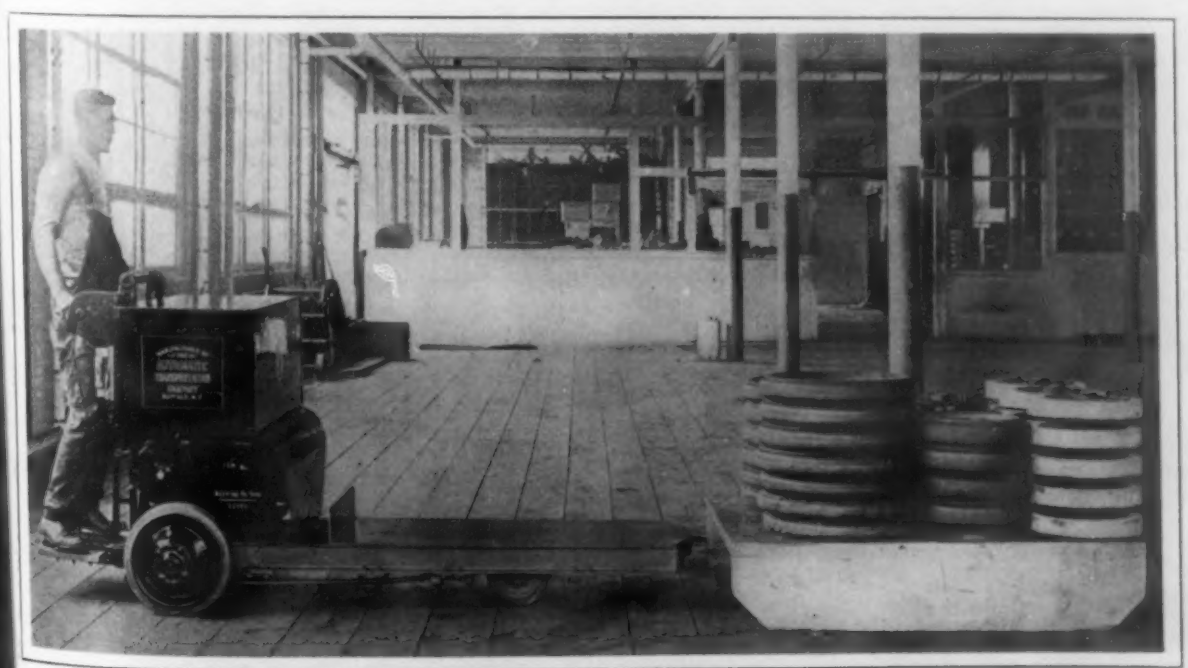


A Trolley for Use on I-Beam Tracks Having No Open End and Arranged with a Pin and a Hinge for Easy Detachment

can be placed over the trolley track. When put on the track it is locked by a pin. One illustration shows the trolley in its closed position on the track and the other shows it open.

The trolley is constructed for hard service. The track wheels have hard steel trolley bearings. The rollers play between hardened and ground steel bushings pressed into the wheels and hardened steel studs or axles. The track wheels are lubricated by forcing grease through the holes in the exposed ends of the axle studs. The trolley is made both plain and geared in sizes from ½ to 3 tons.

The National Warm Air Heating & Ventilating Association, composed of makers of heating furnaces, at a meeting held in Cleveland, Ohio, last week, decided to conduct a general publicity campaign to stimulate the demand for furnaces. Publicity of this character to reach home owners has never before been attempted by furnace manufacturers. A fund of $25,000 was provided for advertising purposes.



An Industrial Storage Battery Truck Having a Geared Drive and a Platform That Is Raised and Lowered Electrically

The Future of the Country's Gasoline Output

The Demand Increasing More Rapidly Than Sources of Supply—New Processes of Manufacture Needed—The Rittman and Hall Methods

BY ALEXANDER E. OUTERBRIDGE, JR.

More than fifty years ago Col. E. L. Drake, amid the jeers and sneers of doubting Thomases, dug the first oil well in Pennsylvania and ever since that time untold wealth has been pouring in upon those who were shrewd enough to take advantage of Nature's generosity and Colonel Drake's ingenuity. Countless volumes have been published on the petroleum industry, but very little has as yet been published regarding the formerly despised by-product obtained in refining coal oil, known as gasoline.

Only a few years ago, comparatively, gasoline was the bugbear of the refiner. It was considered a useless and dangerous product for which there was no market, and it was difficult to get rid of in any way. Gasoline and other waste products of the oil refineries, then called under a general name of "sludge acids," were allowed to run off and often discharged into streams or rivers until the law prohibited the practice on account of its killing fish and fouling the streams.

GASOLINE IN THE BOILER PLANT

The writer well remembers an invitation he received some thirty-five years ago from the superintendent of an oil refinery to visit the plant in order to see a new method of utilizing one of these troublesome by-products. He was provided with dark glass goggles and taken to the power house, where he was told to look through a peep hole into one of the furnaces of the boilers. The interior of the furnace was white hot but apparently quite empty of fuel. There were no grate bars, just incandescent heat. After expressions of amazement the superintendent said, "This heat costs us nothing for we are saving all the petroleum naptha, or gasoline, which we formerly discharged into the sewers, and spraying it with exhaust steam into the fire boxes of the boilers where we formerly burned soft coal and produced a smoke nuisance; now we have no smoke and no ashes, and find no danger from the use of this highly volatile fluid in this way."

MANUFACTURE OF GASOLINE

Crude oil contains on the average about 7 per cent of gasoline and naphtha, 32 per cent of kerosene or burning fluid, and 39 per cent of paraffine. The balance consists of a heavy dark greasy substance formerly regarded as waste product. The great desideratum was burning fluid and this was obtained in greater or less degree of purity by what is technically called "fractional distillation." That is, the crude oil was run into stills and first heated to a very moderate temperature in order to drive off, in the form of vapor, the more volatile constituents known as petroleum ether, naptha and gasoline. These gases could not be allowed to escape into the air, for they form explosive mixtures. They are easily condensed, however, into liquid form, which gave concern to the manufacturers on account of their highly inflammable nature and the difficulty of disposing of them. Next, the temperature of the oil in the stills was gradually raised and "kerosene" driven off and condensed, and so on, until nothing of value was left in the stills.

THE DEMAND FOR GASOLINE

This represents, in a few words, the "state of the art" up to the time, not very many years ago, when the invention of the internal combustion engine created an entirely new demand for gasoline and the perfecting of that cheap and simple method of obtaining power in comparatively small units in the automobile, motor boats, farm engines, aeroplanes, and numerous other appliances has exceeded all computation or preconception.

When we realize that there are at least a million automobiles running every day in the United States and that a single concern turns out 300,000 cars a year, to say nothing of the many thousands of other internal combustion engines using gasoline as their fuel we can, perhaps, begin to form some faint conception of the gigantic strides that have been made in the past few years in this wholly new industry. In addition to all this home demand it is stated that the export from the United States of "motor spirit" (gasoline) amounted in 1913 to 183,000,000 gal.!

It has already been stated that the average normal content of gasoline in crude oil does not exceed 7 per cent and even though the enormous output of ten billion gallons of crude oil per year may be counted upon it is quite evident that there will be a shortage or famine of gasoline in the near future unless some other source of supply be found.

NEW METHODS OF OBTAINING GASOLINE

It has been truly said that "necessity is the mother of invention," and so it has proved in this case. No less than three different methods of obtaining gasoline in vastly increased amounts from petroleum have been patented within the past three years. One of these has already been exploited to a considerable extent by the Standard Oil Company, which has erected a large plant, at a cost of $700,000, at Whiting, Ind., for the production of motor spirit from crude oil by a process known to chemists as "cracking." In this process the molecules of carbon and hydrogen that form kerosene, lubricating oils and other well known products, are broken up, or cracked, and compelled to form new combinations. It is claimed that by this "Burton" process as much as 60 per cent of gasoline distillates may be obtained from some crude fuel oils.

The peculiarity of this process seems to be that considerable pressure is put upon the heated crude oil and also upon the vapors, causing cracking and the formation of gasoline in place of other products. Cracking of crude oil is not a very novel idea for it has long been known that the heavy oils could be cracked so as to greatly increase the proportion of lighter oils, or of kerosene in the final product, but to successfully carry this on farther to the economical production of genuine gasoline belonging to the paraffine series is quite new and is a triumph of practically applied science.

It has been said by some experts that the Burton process yields an unreliable distillate and that it is necessary to add to it quite a large amount of natural gasoline of high grade to render it satisfactory to users.

THE RITTMAN PROCESS

The Rittman process, regarding which sensational articles have recently appeared in print, treats the vapors instead of the liquids. Early in the year Secretary of the Interior Lane announced the discovery by Dr. Walter F. Rittman of the United States Bureau of Mines of two new chemical processes, one of which claims to increase the supply of gasoline enormously, while the other produces artificial dye-stuffs and explosives. It was even intimated that the output of gasoline from petroleum would be increased over 200 per cent and it was estimated that with a present production by independent refiners of 12,000,000 bbl. of gasoline in a year this would mean an output of 36,000,000 bbl., or more than the total product to-day from all sources. So far, however, the Rittman process

has not passed the experimental stage and judging from the statements of Dr. Rittman himself, as given in the *Public Ledger*, Philadelphia, Dec. 17, the glowing prognostications of Secretary Lane should be taken with reserve. Doctor Rittman is reported to have said that so great is the consumption of gasoline in the United States that it is imperative that measures should be taken to conserve the oil resources of the country. He stated that oil-burning vehicles were being placed on the market at a rate in excess of that of the yield of oil. Automobiles are being manufactured at the rate of 1,000,000 a year. Two million automobiles are in use in this country to-day. Three hundred thousand motorboats are in service and the number is increasing. Six hundred thousand farm engines are in use, and there are 6,000,000 farmers in the country anxious to own such engines. The yield of the great Cushing oil fields had fallen off this year, which was the reason the country did not have 300,000,000 gal. to export, as it did last year, and why the price, despite his new process, had gone up. He pleaded with the people of the country not to use fuel oil under boilers. To do so, he said, was to use resources to which future generations were entitled.

THE HALL PROCESS

The third and last process to be mentioned is also an American one, viz., that of William A. Hall, though the development has been made in England.

In 1913 Mr. Hall put up a small experimental plant at Greenpoint, but failing to interest capital on this side of the water he took his plans to England. There he succeeded in obtaining funds to erect a plant having an output of 6000 gal. of motor spirits per day, besides valuable by-products such as benzol and toluol. In a recent address before the Chemists' Club at Rumford Hall, New York, Dr. Charles F. Chandler gave a glowing description of the Hall process. He said that during the past year the English Government had assisted in the erection of a duplicate 6000-gal. plant, that both plants are now working night and day and that a third plant, having capacity of 9000 gal. a day, has been erected in Continental Europe.

The Hall process differs radically from either of the others. Instead of heating the oil in stills, the cracking is performed by vaporizing it in a coil under pressure of about 60 lb. per square inch, then passing it through tubes 300 ft. long and of 1 in. internal diameter, at a temperature of 550 deg. C. The velocity of the vapor exceeds 5000 ft. per minute, passing through the tubes in 3 sec. The vapors next pass into a vertical pipe 12 in. or more in diameter, where part of the cracking takes place. The vapors then pass into a mechanical compressor working at 70 to 100 lb. pressure per square inch.

It is claimed for this process that the gasoline is entirely free from objectionable odor in the liquid and gives an exhaust as free from smell as ordinary gasoline. *Engineering* stated some months ago that gasoline made by the Hall process has been used for thousands of miles in different cars without trouble from sooting of plugs or carborizing of cylinders and that it gives 15 to 20 per cent more mileage than ordinary gasoline.

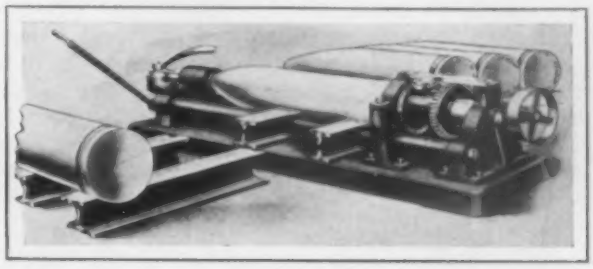
There are still other novel methods "in the air" for increasing the output of gasoline, one of the most interesting being the suggestion of Mr. Hall that the most economical source of gasoline in the future may be from water gas where oil is used for carburetting the gas and instead of cracking all of the oil into permanent gas a portion may be withdrawn in the form of gasoline, the remainder being the ordinary water gas.

In conclusion it may be said that this field of research is one of the most fertile in the whole world of applied science to-day and it is one in which startling discoveries may be confidently expected in the near future.

It is reported that the blast furnace at Rome, Ga., long idle, has been leased and will be operated. H. H. Shackelton is mentioned among those interested.

Machine for Marking Large Shell Ends

A machine for marking the ends of large heavy shells has been placed on the market by the Noble & Westbrook Mfg. Company, Hartford, Conn. It supplements the one which was illustrated in THE IRON AGE, Dec. 9, 1915, and enables shells of all sizes to be stamped clearly by unskilled labor. The special features about the machine are the use of an automatic ejecting device for the shells after they are marked and the employment of a type of die in which it is possible to insert or remove letters or figures as may be necessary for marking the different sizes and styles of shell.



A Machine for Marking Large Shells on the End Without Lifting Them

The machine is claimed to be capable of an hourly output of 300 shells and is built for heavy work. Although the construction is heavy, it is pointed out that it is nevertheless simple, thus doing away with the necessity for employing a man possessing a high degree of mechanical skill. The machine is driven by a belt connection to tight and loose pulleys mounted on the machine, thus eliminating the necessity for a countershaft.

In operation a platform or rack is built on either side of the machine and the shell to be marked is rolled into position and clamped by turning the curved lever at the left, which operates a locking plunger to seat the shell. Only a few seconds are required to stamp the end of the shell and when this is complete the locking device is loosened and the straight lever is pulled. This has a cam adjustment which automatically raises the shell from the machine and another one takes its place. In this way, it is pointed out, a large output is secured, as the marking operation is rapid, and no lifting of the shells is required.

New Engine Lathe with Large Swing Over Ways

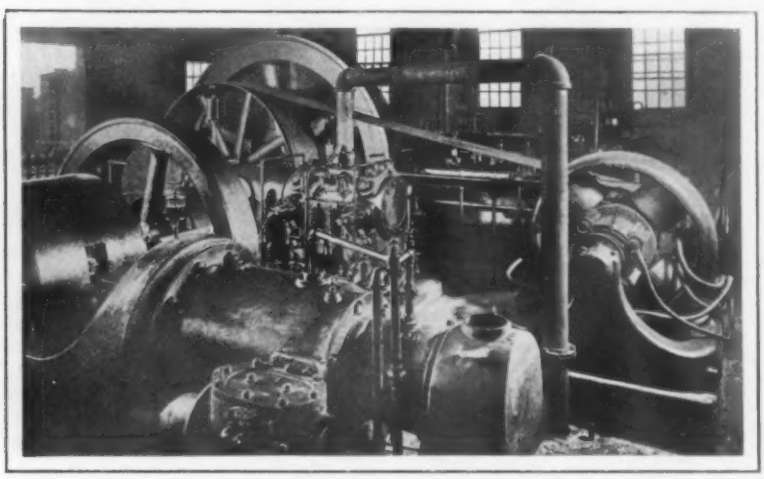
An engine lathe having a swing of 8½ in. over the carriage and 18 in. over the ways has been developed by the Davis Machine Tool Company, Inc., Rochester, N. Y. The lathe, which is equipped with positive feed and quick change gear box, is driven by a four-step cone pulley over which a 3¼-in. belt runs. The quick change gear box provides for 32 changes ranging from 2 to 32 threads per inch, and if desired special or fractional threads may be cut by changing the end gears. The tailstock is of the offset type and has a set-over for turning tapers. The longitudinal and cross feeds are operated from the front of the apron and a chasing dial for catching threads is provided. The lathe is regularly built with a 6-ft. bed, which gives a swing of 29 in. between centers and the equipment ordinarily furnished includes large and small face plates, a countershaft, the necessary wrenches and steady, follow and compound rests. If desired a taper attachment, oil pan and pump and any desired length of bed can be furnished at extra cost.

The Atkins Pioneers, composed of men who have been in the employ of E. C. Atkins & Co., saw manufacturers, Indianapolis, Ind., for twenty years or more, will celebrate the tenth anniversary of the organization Saturday night, Jan. 29, with a theater party. There are 118 members, the oldest of whom, John H. Wilde, has a record of fifty-one years of continuous service.

Oil Engine Electric Plant of the Crucible Steel Castings Company

BY J. M. HARDING

The engine room at the plant of the Crucible Steel Castings Company, Landsowne, Pa., is a brick and concrete structure, 35 x 40 ft. The power equipment consists of one 200-hp. single-cylinder type FH oil engine and a 15-hp. single-cylinder type HA unit, both built by the De La Vergne Machine Company, New York City. The arrangement of the engine rom is shown in the accompanying illustration, the smaller of the engines, which is belted to a 9-kw. direct-current generator, being in the foreground. The larger engine in the background has a cylinder 23 in. in diameter with a 40-in. stroke and runs at 135 r.p.m. The shaft of this engine is extended on one side to take a flywheel and pulley,



The Engine Room at the Plant of the Crucible Steel Castings Company with a 15-Hp. Oil Engine in the Foreground and a 180-Hp. Unit in the Background Driving an 80-Kw. Generator Through a Belt Connection and Directly Connected to an Air Compressor

and a direct connection to a 16 x 18-in. Bury variable volume air compressor is made, the crank disk being mounted on the end of the engine shaft. The pulley drives an 80-kw. direct-current generator, which furnishes electric power for the entire plant.

The main building of the plant measures 100 x 340 ft. with a middle bay 40 ft. wide. The equipment of this building includes a 10-ton traveling crane, eight eight-pot furnaces having a daily output of 8 tons of steel, eight hand-power and motor-driven molding machines, two stationary grinding machines, a swing frame grinding machine with motor drive, a motor-driven sifter and a power-driven sand mill. The sand blast building measures 18 x 32 ft. and is equipped with a 350 cu. ft. machine operating at a pressure of 80 lb. The pattern storage building is 20 x 120 ft., and the pattern shop is equipped with the customary woodworking machines.

The power plant is operated by one engineer, and the larger oil engine operates from 6:45 a. m. to 6 p. m. The generator supplies power to a motor-driven pump used for supplying oil from a 20,000-gal. central storage tank to the furnaces and the engines. From 2:45 to 6:45 a. m. the smaller engine is in operation for pumping oil to the furnaces and for making light, this engine being started and operated by the night watchman.

The average load is about 140 hp. and the fuel consumption of the two engines is 110 gal. of oil, this last figure being approximate, as the oil for the furnaces os pumped from the same tank. A barrel of cylinder and a barrel of engine oil are used in the entire plant every month, and this oil is filtered after using through an Anderson pressure filter. The cost of the lubricating oil is approximately 20c. per gallon, and the cost of fuel oil is $83 a month, or approximately 3c. per gallon.

Control of Petroleum and Gas Wells

Practically all petroleum and gas wells, until recently, were drilled without any means of control. The introduction of metal casing to secure a permanent and impervious wall made the drilling of deep wells possible, but did not insure its control. The way this has been successfully done is set forth in a paper by Alfred G. Heggem, Tulsa, Okla., to be submitted at the New York meeting of the American Institute of Mining Engineers in February.

For the inlet at the bottom of the well a pressure-tight joint has been developed in two different types, the "long shoe" and the "packer," which are placed upon the end of the casing. To control the outlet, valves of various kinds were tried; but even the gate valve, which was the best type developed, failed at times, because it could not be quickly closed. The author discusses the requirements for a proper controlling device as follows:

> It must permit drilling operations to be carried on without interference; allow for immediate and tight closing; control the flow without back pressure; insure safety to workmen; be simple in construction; compact in size; sufficiently strong to control maximum pressures; proof against injury in handling, and unaffected by sand and by fire.

A new control head casing, now in successful operation on approximately one thousand wells, is believed to meet all these conditions. It combines the functions of a gate valve and a casing head and consists of four pieces having but one moving part. Rough handling during the usual drilling operations cannot damage it.

It is arranged to receive the standard fittings commonly used with casing heads. The top opening is threaded to receive a drilling nipple or other top connections. The interior of the head is bored out to a true cylindrical form into which is closely fitted the plug or valve, open at one end to provide a lateral passage for the oil or gas, the other end reduced in diameter to form a stem, which extends through a suitable stuffing box and by which the valve may be operated. On the stem side of the valve a flat surface, or flange, fits closely against the base of the stuffing box, making a tight joint. The extending stem is hexagonal in form to accommodate a wrench, but a transverse hole through it provides a more convenient means of operating by use of a bar of iron, such as a bolt or piece of 1-in. pipe.

The back of the valve is broad enough to close completely either top or bottom opening in the body, and provide sufficient lap to prevent leaking. On each side of the back is a groove of sufficient size to encompass the drilling line, sand line, or torpedo line. By this provision the valve, when closed, while shutting in any flow, does not injure the line. By means of the end opening, as well as by recessing the back of the valve, the pressures within the casing head are to a large degree counterbalanced by the end opening and the recesses in the back of the valve, making the operation of the valve easy.

The Triumph Ice Machine Company, Cincinnati, Ohio, has issued a list of recent sales of its ice-making and refrigerating machinery and fittings which shows the exceedingly wide range of territory over which its activities extend. Not only are all parts of the United States covered in this statement but distant foreign countries, a plant having been sold to Bombay, India.

Government Armor Plant Inquiry

Testimony of Armor-Plate Makers Before Senate Committee on Naval Affairs—The Government Project Vigorously Opposed

WASHINGTON, D. C., Jan. 25, 1916.—The Senate Committee on Naval Affairs on Jan. 18 and to-day heard the representatives of the Bethlehem and Midvale steel companies in opposition to Senator Tillman's bill appropriating $11,000,000 for the construction of a Government armor plant. President E. G. Grace addressed the committee on behalf of the Bethlehem Company, while President A. C. Dinkey and Vice-President W. P. Barba spoke for the Midvale Company. All the speakers urged the committee not to embark the Government in the armor-plate business and gave many practical reasons against the project embodied in the bill. In reply to questions by members of the committee the witnesses gave more information than has heretofore been available regarding their costs of producing armor and they all volunteered to furnish the committee or the Secretary of the Navy, in confidence, with every detail relating to costs, stating that they would object only to supplying this information for general publication.

The committee was also informed that the armor-plate manufacturers are prepared to make substantial reductions in the current price for armor in consideration of the authorization by Congress of a continuing program of naval construction. On the conclusion of the hearing it was informally agreed that the representatives of the armor-plate manufacturers should confer with the Secretary of the Navy, supply him with data concerning the cost of producing armor plate in the several establishments and endeavor to agree on a satisfactory base price for future contracts. The committee will meet again Feb. 1, when it is understood that Secretary Daniels will appear to advise Senator Tillman and his colleagues as to whether it has been found practicable to reach a satisfactory understanding with the armor-plate manufacturers. Significant comments were made by members of the committee on the fact that the invitation to the armor-plate manufacturers to attend the hearings was not accepted by the Carnegie Steel Company, no representative of that corporation being present.

Testimony of Bethlehem Steel Company

President Grace, of the Bethlehem Steel Company, who was the first witness, began his testimony by placing before the committee an exhibit of the prices and tonnage of armor plate bought by the United States from his company from 1887 to 1914, inclusive, as follows:

Years	Base Price	Tonnage of Contract
1887	$510.00	6,702.60
1893	520.00	3,562.24
1896	515.40	2,653.00
1898	400.00	3,964.47
1899	400.00	1,142.19
1900	420.00	18,588.00
1903	420.00	3,362.00
1903	420.00	5,986.00
1905	420.00	4,959.00
1906	346.00	1,824.00
1907	420.00	3,579.00
1909	420.00	3,137.00
1909	420.00	4,594.00
1911	420.00	2,257.00
1911	420.00	2,212.00
1912	420.00	5,022.00
1913	454.00	2,669.00
1913	440.00	2,602.40
1914	425.00	16,256.00
Total		95,072.00

The average yearly award, as shown by the above table, was 3280 tons, and the average base selling price $432.62. In comparison with these figures Mr. Grace quoted the prices paid at the present time for armor by the principal naval powers as follows, per ton: Japan $490; Austria, $511; Italy, $405; Germany, $490; France, $460; England, $503; Russia, $368.

DATA OF PREVIOUS GOVERNMENT INQUIRIES

In reply to questions concerning the cost of producing armor plate under various conditions, Mr. Grace submitted a statement embodying data secured by the Niles Board for its report to the Fifty-ninth Congress and by the Tillman Board which reported to the Sixty-third Congress, the former showing the production cost to be $244.27 and the latter $262.79. These figures, Mr. Grace said, were based on full capacity operations, and he drew attention to the fact that the Niles Board reported that in the case of a plant operating at half capacity the cost would be increased 20 per cent, while working at one-third capacity there would be a 30 per cent increase. All these reports, he said, gave mere shop cost and omitted many items that enter into the actual total cost, such as administrative and general expense, insurance and taxes, interest on plant investment and working capital, etc. With a view to showing how the figures secured by the Niles and Tillman boards would work out if the necessary administrative items were added thereto, Mr. Grace submitted the following table:

	A	B	C
Production cost, plant operating at full capacity (Tillman report)	$262.79	$262.79	$262.79
Add for plant operating one-third capacity 30 per cent (Niles report)	.....	79.60	.....
Add for plant operating two-thirds capacity, 10 per cent (taken proportionately from Niles report figures)	.....	.....	26.28
Total production cost	262.79	342.39	289.07
Administrative and general expense ($100,000 per year)	10.00	30.00	15.00
Taxes and insurance ($45,000 per year)	4.50	13.50	6.75
Interest at only 5 per cent on $7,100,000 plant ($355,000 per year)	35.50	106.50	53.25
Interest at only 5 per cent on $500,000 working capital ($25,000 per year)	2.50	7.50	3.75
Total	$315.29	$499.89	$367.82

A: Cost per ton with plant provided with sufficient contract tonnage to operate at full capacity (10,000 tons). (This is a condition that has never been maintained.)

B: Cost per ton with plant provided with only sufficient tonnage to operate at one-third capacity. (This approximately represents actual average conditions that have obtained.)

C: Cost per ton with plant provided with sufficient tonnage to operate at two-thirds capacity. (This condition might obtain as a result of the proposed five-year program.)

If the contracts awarded in the future should be in the same average quantities as in the past (namely 3280 tons per year, or about one-third our plant capacity) the present price of $425 per ton would provide as follows:

		Per Ton
Contract price		$425.00
Less—		
Production cost (column B)	$342.39	
Administrative and general (column B)	30.00	
Taxes and insurance (column B)	13.50	
		385.89
Leaving for interest on investment		$39.11

With contracts for 3280 tons, this would provide only $128,280.80 per year, or less than 1¾ per cent on the investment without any provision whatever for repayment of the capital invested in the plant when it may have to be abandoned, owing to the building of a Government plant or some radical change in the method of manufacture.

For the purpose of furnishing a comparison from a business point of view of an armor plate plant and a standard steel manufacturing plant, Mr. Grace laid before the committee the following statement:

The $7,100,000 invested by Bethlehem Steel Company in its armor-plate plant and appurtenances would be sufficient for the building of a rolling mill with an annual capacity of, tons	400,000
During the 29 years the armor-plate plant has been in operation this mill would have produced, tons	11,600,000
Where the armor-plate plant produced, tons	95,072

The product of the mill would sell at about $35 per ton, on which a moderate profit would be 10 per cent, or $3.50 per ton.

(Continued on page 262)

ESTABLISHED 1855

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Steel Works Labor Conditions

More blatherskite utterances on labor questions have emanated from Washington, the comment now made on the recent strike and riot at Youngstown, Ohio, steel plants being of the same sort that the same author prepared for the Commission on Industrial Relations. This extract will indicate what manner of man this commission chose to become one of its spokesmen:

The Youngstown strike was a sign to the owners and managers of the American steel industry that the end will come; that they cannot forever adhere to their present policy of depressing wages below a decent standard by maintaining a vast horde of helpless immigrants in a condition of economic subserviency, throwing them on charity during times of depression, paying less than a living wage during times of prosperity, and during all times brutalizing them either by imposing excessive hours of employment or by imposing the enforcement of conditions that breed fear and pauperization.

American steel manufacturers have maintained the highest wages paid in that industry in the world, and in recent years have paid relatively higher wages than other industries in this country. They have made working conditions better each year, and housing conditions in many steel towns have been good beyond the capacity of workmen to appreciate or to preserve. To say that the record of manufacturers in these respects has been one of commendable progress and of increasing recognition of their responsibilities is to state the case with the greatest moderation. No decade in the history of the steel trade has contributed a tithe of the betterment that has come to workmen in such employment in the ten years just ended, and the last two years have been the best of the ten in that regard. Yet statements are put forth with semi-official sanction that go to Europe and are repeated and commented on to the hurt of the American steel industry, giving an utterly and outrageously untrue picture of labor conditions here. That the commission appointed with so many extravagant promises of uplift and of help to a better understanding between employers and workers should have become the vehicle of such foul slanders can only be deeply humiliating to the Administration.

What adds insult to injury in the statements quoted above is the evidence that has been accumulating of the activity of certain foreign consular offices in inciting the disturbances at Youngstown.

The Ferromanganese Situation

Ferromanganese production in the United States in 1915 exceeded that of any previous year. In view of the conditions prevailing, this is an unexpected and remarkable achievement. A year ago, with two of the principal world sources of manganese ore cut off by the war, such an outcome would not have been believed possible. With practically no high-grade manganese ore mined in this country and with the third large world source, Brazil, having formerly furnished only 20 per cent of this country's usual supply, it is a tribute to the enterprise of American industry that so much of the expected deficiency has been met.

Our analysis of the general situation on another page shows that the apparent available supply in 1915 was a little more than normal, based on a five-year average, but considerably less than that of 1912 and 1913. The actual consumption in those years is not known and the total for 1915 was probably less than the apparent available supply of 201,743 gross tons, for early in the year steel production was below normal. The surprising fact, however, is that this exceeds the apparent yearly consumption of 200,156 gross tons based on a five-year average, in view of the extraordinary conditions.

While the total consumption last year was probably less than either of these figures, because of the reduced steel output early in the year, present consumption is shown to be at the rate of not far from 221,000 tons per year, or 18,467 tons per month, assuming steel practice to be the same as before the war. Such a condition would show a deficiency of 1655 tons per month. It is highly probable, however, that this loss has been more than offset by improved and changed methods in practice. While it is known that spiegeleisen is playing a not unimportant rôle as a substitute for part of the usual charges of ferromanganese, it is also understood that other metallurgical expedients have been introduced which lower the ordinary consumption. Less of the alloy has been found necessary in some cases to achieve the desired results, due to more careful furnace practice, and the use of a high manganese molten pig iron in recarbonizing is also

a more widely practised mode of introducing some manganese.

The future is not as full of pessimism as it was a year ago, assuming conditions of the past few months to continue. While our supplies of the English alloy are not likely to increase greatly beyond present receipts as long as the war lasts, the combined supplies of ore from Brazil and Cuba give promise of continuing or increasing, for recent months have shown notably larger imports.

We hear much now of preparedness, military and industrial. It is well to keep in mind the fact that this country is absolutely dependent on foreign sources for most of its supplies of manganese ore and that most of our steel cannot be made without ferromanganese. It is not improbable that international relations might sometime be such that this supply might be cut off as well as our nitrate imports without which powder cannot be made.

German Conservation of Workers

Recent advices from Germany throw an interesting light on the measures being taken to conserve the strength of its working population, particularly in the metal industries, and to utilize to the utmost all skilled labor available during and after the war. The last named is a factor of importance to Americans, as it has a very material bearing on the competition German manufacturers will be able to offer in the years to come.

The present situation is one for which, with all their thoroughness, the Germans were not prepared. While quasi-governmental agencies began, as far back as 1906, to build up an enormous insurance reserve for soldier workmen invalided in war, there was such confidence in a speedy conclusion of hostilities when they came, that the vast number of permanently disabled men and the effect which the total losses would ultimately have upon industry appear to have been almost wholly ignored.

When, however, the conditions of the great struggle became clear, the "Magdeburg idea" for saving and utilizing the productive capacity of invalided soldiers was soon put into operation. This movement originated in a gathering at Magdeburg of men prominent in the manufacturing industries and in welfare work. They established prizes for methods and appliances which would enable crippled workmen to carry out the duties normally possible only to uninjured men. The idea was at once taken up and extended to various industrial districts of the empire. It is now being developed—with additional prizes—principally under the auspices of the Verein Deutsche Ingenieure; and the Verband Deutsche Diplomingenieure has called upon its members to assist in perfecting all inventions for this purpose.

At the Royal Technical High School in Charlottenburg, a suburb of Berlin, there was already a permanent exposition of material and data pertaining to welfare work (Ständige Ausstellung für Arbeiterwohlfahrt), and this is being enlarged by an exhibit of all appliances brought out as a result of the new movement. Various parts or duplications of this exhibit will be sent at different times to the industrial centers where their practical value can be best applied.

So far as possible, crippled workers are to be aided in returning to the tasks for which they were originally trained; but in a considerable percentage of cases this is not practicable, owing to the loss of limbs or faculties, and for such men new employment must be found. This problem is naturally the most difficult of solution, and it presents endless ramifications; but the Germans are cheerfully and efficiently working it out.

The Magdeburg idea, furthermore, is having an evolution which promises to stamp its impress deeply upon the future of German industrialism and consequently upon the competition which it will again offer in the commerce of the world. This arises from the stimulus given to the invention and use of labor saving machinery. One German correspondent asserts that more has been accomplished in this direction within the past ten or twelve months than in a number of years heretofore. This is a factor to be reckoned with, both in the protection of our own domestic trade and in the extension of our growing exports.

A situation by which German manufacturers were confronted immediately after the outbreak of war was in caring for the families of the men called to the colors. The records of 132 large iron, steel and machinery plants have been made public. At last accounts these were employing a total of 310,000 men and contributing regularly to the support of nearly 66,400 families, at the rate of 35,500,000 marks annually, or 535 marks per family. This is in addition to substantial sums raised by the men of the plants themselves for the dependents of their comrades in the field, but which are practically paid by the employers in the shape of increased wages. Hence the burden on them has been at least double the amount above mentioned. It has been enlarged still further by the imposition of taxes on these relief funds. In one case, which has been cited before the authorities in an effort to obtain relief, the state, community and industrial taxes amount to nearly 20 per cent of the beneficences, and the donors are still faced with the probable levy of retroactive "war-profit" taxes.

A striking feature of the situation, from both the German manufacturers' and workers' standpoints, is the substantial showing made by the complicated system of industrial insurance in standing up under the strain imposed on it by the war. This includes sickness, accident and invalid benefits. Payments to men invalided in army service, as well as to the dependents of those who have died, were extremely large during the first year of the war, and they are still heavy; but it is stated on authority that all obligations have been promptly met. Sick benefit funds administered for the men who remained at their places in the plants have also been subjected to severe depletion, due to the withdrawal of the sturdiest workers and also to the poorer physical condition, in general, of the men left behind. However, the handicap has been partly overcome by greater care in sanitary arrangements and in measures taken to prevent sickness. The fact that excesses in eating and drinking are now almost unknown has been an aid in keeping the men and their families in good condition. It also strengthens the efficiency of the workers.

Payments of industrial insurance to beneficiaries are now averaging about 2,300,000 marks daily. This would exhaust the resources available

for the purpose were it not for the vast cash reserve fund. A provision of the act of 1906 gave workers the same invalid and death benefits, while serving as soldiers, as are provided for times of peace. At the outbreak of war the fund amounted to over 2,000,000,000 marks, and thus, with the dues now being paid in, it will in all probability last until after the conclusion of peace. About one-fifth of the amount is invested in Government war loans.

So far, the iron, steel and metal-working plants of all kinds have suffered very much less from the withdrawal of workers than have agriculture, mining, textiles and some other industries. This is owing to the fact that, as in England and France, they are vitally needed for the production of ordnance, munitions and a great variety of equipment for army, naval and transportation service. Thus, to a greater extent their organizations of skilled workers are being kept together. But on the other side are the difficulties of obtaining raw material, wage increases publicly stated to be as much as 20 per cent, and a scale of taxation which threatens to become unbearably heavy.

How these factors can be balanced after peace has been declared, so as to insure the continued welfare of the workmen, retain the full productive capacity of the nation and enable German industries to compete on favorable terms with those of other manufacturing countries, it is too early to predict. But the wise measures of conservation above described will go far toward strengthening Germany for the part which it must play in reestablishing foreign commerce at the close of the war.

CORRESPONDENCE

French Needs After the War

To the Editor: I read in THE IRON AGE of Dec. 9, 1915, page 1359, that, in accordance with a cablegram from Paris to the Associated Press, I have made certain statements regarding French financial and industrial demands on the United States after the war. I have not made any such statement to anyone on this subject nor have I one to make. Sometime ago I had a visit from Walter S. Kiatt, who was presented to me as the correspondent of the ——— ——— ———. He said that some one in America had cited the Comité des Forges in France as the organizer of a locomotive trust. I replied that the statement in question was inexact for two reasons: Because in France our comptoirs do not in any way resemble trusts and because the French builders of locomotives have not organized comptoirs. That was the extent of our conversation.

ROBERT PINROT,
Secretary-General, Comité des Forges.

Paris, France, Jan. 7, 1916.

In connection with the subscriptions of United States Steel Corporation employees to the common stock at 85, the figure named in the corporation's recent offer, the bonus promised subscribers is 5 per cent a year for five years. This means that employees holding the stock receive 6 per cent on their investment, regardless of any dividends declared on the stock. In connection with the offer of two years ago the bonus was $3.50 and it has been as low as $3.

STEEL CORPORATION RECOVERY

Earnings in 1915 Exceed 1914 by 82 Per Cent—Dividend Declared on Common Stock

The earnings of the United States Steel Corporation for the last quarter of 1915 were $51,232,788. The total earnings of the year were $130,351,296. As the earnings of 1914 were $71,663,615, the gain over that year was $58,687,681, or nearly 82 per cent. The earnings in 1913 were $137,181,345 and in 1912 were $108,174,673. Thus the corporation recovered its lost ground splendidly last year.

The detailed statement for the quarter ended Dec. 31, 1915, as compared with the corresponding quarter of the previous year, is as follows:

	1915	1914
October earnings	$16,563,854	$5,580,533
November earnings	16,990,968	2,798,388
December earnings	17,677,966	2,554,249
Total earnings after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants and interest on bonds of the subsidiary companies	51,232,788	10,933,170
Less charges and allowances for depreciation:		
Sinking funds on bonds of subsidiary companies and depreciation and extraordinary replacement funds	8,729,053	3,027,444
Sinking funds on U. S. Steel Corporation bonds	1,650,622	1,560,468
Net income	40,853,113	6,345,258
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding and premium on bonds redeemable under sinking funds	5,687,777	5,777,081
Balance	35,165,336	568,177
Add net balance of sundry charges and receipts	794,057	130,460
Balance	35,959,393	698,637
Dividends for the quarter on stocks of the U. S. Steel Corporation:		
Preferred, 1¾ per cent	6,304,920	6,304,920
Common, 1¼ per cent	6,353,781	.....
Surplus for the quarter	$23,300,692	*$5,606,283
Surplus for the year	$44,215,717	*$16,965,685

*Deficit.

A year ago the dividend on the common stock was passed. A dividend of 1¼ per cent has been declared for this quarter, payable March 30. Thus the recovery of the corporation is complete.

At the close of the directors' meeting, Jan. 25, Chairman E. H. Gary gave out the following statement: "The earnings for the quarter, amounting to $51,232,788, are $5,729,084 larger than in any previous quarter. As usual, they were not made up until the day of the meeting of the directors. The amount of cash in banks is about $105,000,000. The members of the Finance Committee and of the board of directors were all in favor of the declaration of the 1¼ per cent on the common stock."

The Youngstown-Cambria-Lackawanna Consolidation

No official announcement has been forthcoming in regard to the proposed merger of the Youngstown Sheet & Tube Company, Cambria Steel Company and Lackawanna Steel Company, which has been under way for several months. Some time ago the majority of the holders of the common stock of the Sheet & Tube Company gave an option on their holdings to the company at the price of $300 per share, and this option expires at midnight Jan. 31. It is believed, therefore, that, because of this, some definite announcement will be made this week as to whether the proposed merger will go through or not.

M. A. Hanna & Co., Cleveland, Ohio, have purchased a controlling interest in the Frontier Steamship Company and the Niagara Transit Company, North Tonawanda, N. Y., and have thus acquired control of the five large Lake steamers owned by these two companies.

FERROMANGANESE SUPPLIES

Domestic Production in 1915 Largest Recorded—The Present Situation

THE IRON AGE has obtained from the Government, in advance of their usual publication, additional statistics covering the latter part of 1915, which bear directly on the ferromanganese situation as related to the steel industry of the country and is thus able to publish a review of the conditions for 1915 as well as the present status. Previous analyses of the subject appeared in THE IRON AGE of March 4 and Aug. 5, 1915. The present compilation presents some unexpected features.

FERROMANGANESE IMPORTS

Imports of ferromanganese for 1915 have been decidedly below normal, as has been indicated from time to time in these columns, due of course to the restrictions imposed by Great Britain to conserve her own supply. About half of our consumption of this alloy in normal times comes from England. The following table gives the official data of these imports for last year, the data for the last two quarters having been furnished THE IRON AGE:

	Gross Tons	Gross Tons per Month
Quarter ended March 31, 1915....	548	182
Quarter ended June 30, 1915.....	19,857	6,619
Quarter ended Sept. 30, 1915.....	20,396*	6,798
Quarter ended Dec. 31, 1915.....	14,400*	4,800
Total for 1915.....	55,201	4,600
Total for 1913.....	128,070	10,672
Average per year for 5 years, 1910-1914	100,793	8,399

*Government data furnished THE IRON AGE.

The imports for 1915 are therefore 45.5 per cent less than normal receipts based on a 5-yr. average. The monthly receipts last year were only 4600 tons as against 8399 tons under normal conditions. The low imports in the first quarter of the year were due to the British embargo then existing.

THE BRITISH MANGANESE ORE SUPPLY

The British manganese situation has been dominated by the supplies of manganese ore which during the first eight months of 1915 have been much below normal. Average imports into Great Britain to Sept. 1, 1915, were only 20,629 gross tons per month, but for September, October and November they have increased to 57,761 tons per month. These figures compare with an average monthly importation in 1913 of 50,098 tons and in 1914 of 39,953 tons. For the first eleven months of 1915 the total imports were 338,053 gross tons, or at the rate of 30,732 tons per month to December. While supplies are below normal, recent large imports reveal an easing of the situation which, if it continues, will tend to relieve the situation here. And this is true, despite the soaring prices paid in England for manganese ore, recent quotations for Indian ore being reported at 58c. and 59c. per unit, and for Brazilian ore, 97c. per unit.

OUR MANGANESE ORE IMPORTS

Imports of manganese ore into this country in 1915 have been larger than is generally suspected by the trade and beyond the expectations of many early in the year. The following table gives the importation by months, those for December being partly estimated, the figures for the two largest ports of entry, Philadelphia and Baltimore, being 61,150 tons for December as furnished THE IRON AGE:

Manganese Ore Imports into the United States for 1915

	Gross Tons		Gross Tons
January	9,849	July	28,988
February	27	August	57,867
March	398	September	28,989
April	218	October	26,887
May	16,645	November	50,629
June	31,011	December (estimated)	61,500
Total	58,148	Total	254,860
Total for 1915			312,908

The increase in the last half is marked, or from 9691 tons per month to July 1 to 42,476 tons per month for the last half. Probably 98 per cent of this came from Brazil.

Comparing the data for 1913, 1914 and 1915 we have the following imports of manganese ore:

	1913, Gross Tons	1914, Gross Tons	1915, Gross Tons
Total for the year.....	345,090	283,294	312,908
Average receipts per month.....	28,757	23,608	26,075

The average importations for 5 years (1910 to 1914) were 269,649 tons per year, or 22,470 tons per month.

The 1915 importations, while not as large as in 1913, were considerably in excess of the total for 1914, and particularly of the average total for the 5-yr. period, the monthly receipts in 1915 of 26,075 tons comparing with 22,470 tons per month for the normal 5-yr. period.

In some respects this showing is rather remarkable when it is considered that practically all of the 1915 receipts have come from Brazil, the Russian ore being inaccessible and but little of the Indian ore available. Two small cargoes came from Cuba. Previous to the war the Brazilian supply was inconsiderable as compared with the Indian and Russian, being only 20 per cent of the 1913 imports. The evident speeding up of the Brazilian output was not thought possible at one time.

DOMESTIC PRODUCTION OF FERROMANGANESE

The production of ferromanganese in this country in 1915 was larger than in any previous year. The total, as compiled from THE IRON AGE'S monthly blast-furnace reports, was 146,542 gross tons, or 11,795 tons per month. The largest previous total was 125,378 tons in 1912, or 10,448 tons per month, while the average for the 5-yr. period, 1910 to 1914, was 99,363 tons per year, or 8280 tons per month. This is also an unexpected showing. The increase is due to the large production developed by some of the domestic producers outside the leading interest which produces all it consumes.

AVAILABLE SUPPLY

Summarizing the foregoing and taking the sum of importations and the production of the alloy as the apparent available supply for consumption, we have the following:

	Imports, Gross Tons	Production Gross Tons	Apparent Supply, Gross Tons	Apparent Supply per Month, Gross Tons
1912.....	99,137	125,378	224,515	18,709
1913.....	128,070	119,495	247,565	20,630
1914.....	82,217	106,083	188,300	15,691
1915.....	55,201	146,542	201,743	16,812
Average for 5 years, 1910-14...	100,793	99,363	200,156	16,679

This shows that while the imports have decreased, the production has increased to such an extent that the apparent available supply for consumption in 1915—201,743 tons—was a little more than that of the 5-yr. period of 200,156 tons per year.

This is an unexpected conclusion. It does not mean that the present sources of supply are sufficient to meet all needs, for much of the alloy is closely held by some producers for their own consumption. Nevertheless, if recent events and conditions continue to improve, the general situation is not as serious as was thought some months ago.

While the largest apparent consumption was 247,565 tons in 1913, it is difficult to gage the actual annual consumption then or now. It is believed that present consumption has been decreased relatively by the partial substitution of spiegeleisen for some of the usual ferromanganese additions as well as other economies and methods. While the present output of steel is probably at the rate of about 40,000,000 tons of ingots and direct castings per year, the output early in 1915 was much below this. The present demand on ferromanganese supplies is probably according to the following equation:

40,000,000 gross tons × 73 per cent = 29,200,000 gross tons × 17 lb. = 296,400,000 lb., 221,607 tons

in which 29,200,000 gross tons represents the production of non-Bessemer steel; the Bessemer steel, 27 per cent of the total output, not requiring ferromanganese

in its production. At 17 lb. of ferromanganese per ton of open-hearth and other steel produced, the present consumption or need is about 221,607 tons of ferromanganese per year. Comparing this with 201,743 tons available for consumption on Jan. 1, 1916, the apparent lack of alloy is not large and it is probably compensated for by various methods of reduction in the amounts used.

The Supply of High-Grade Ferrosilicon

The high-grade ferrosilicon situation is a source of anxiety to some consumers and the demand is very strong with practically record prices of $90 to $100 per ton being offered and paid at present. Before ferrosilicon was made in Canada and this country it was imported largely from France and Austria at as high as $125 per ton. For several years, however, nearly the entire consumption in this country has come from Canada and from domestic producers.

Various estimates in the trade place the present consumption anywhere from 30,000 to 40,000 tons per year. This is due not only to the largely increased steel production but to the unusual silicon content demanded by certain munition specifications for steel bars and shell material. These are said to require anywhere from a minimum of 0.10 to 0.30 per cent silicon in the steel. Consumption, therefore, is at a record rate.

While the domestic output has been increased by the entrance into the market of one or two entirely new producers in this country, the imports into the United States from Canada and Europe have been diminished by war conditions and the demand for the alloy in Europe. Imports recently have been decreasing, as shown by the following table:

	1915, Gross Tons	1914, Gross Tons
August	86	1,113
September	142	355
October	370	650
Per month for 3 months	199	706
10 months ended Oct. 31	4,144	5,591

The average monthly rate at present of 414 tons to Nov. 1, 1915, compares with 559 tons for the same period a year ago.

Germany's October and November Steel Output —Record Electric Steel Production

Germany's steel output for October, 1915, was 1,215,287 metric tons and for November it was 1,192,967 tons, according to official data. These figures contrast with 1,174,350 tons for September. The October total is the largest since the war started, the daily rate being 47,498 tons, while the November rate was 45,883 tons per day. The best previous daily rate was 45,176 tons in September, 1915. The October and November output was made up as follows:

	October, Metric Tons	November, Metric Tons
Bessemer steel ingots	594,826	580,996
Open-hearth ingots	532,501	522,441
Steel castings	64,532	67,305
Crucible steel	8,476	8,946
Electric steel	14,952	13,279

In October and November, 1914, the steel output was 900,201 and 900 020 metric tons respectively. To Dec. 1, 1915, the total steel production was 12,025,000 tons, as compared with 14,025,130 tons to Dec. 1, 1914.

The electric steel output continues its rapid expansion. The October output of 14,952 tons is the largest since the war as well as the largest monthly output in Germany's history, the November production of 13,279 tons standing second. The production of the electric furnaces of Germany in July, August, September, October and November was 65,154 tons or 13,030 tons per month. In 1913, the record year, the average monthly output was only 8479 tons. Previous to July, 1915, the monthly war average was 6763 tons per month.

Press reports are to the effect that the December steel output of Germany was 1,020,144 metric tons.

Press reports that the Lochiel furnace, Harrisburg, Pa., owned by the Pennsylvania Steel Company, will resume operations are denied by the company. The furnace has been idle since 1913.

Ohio Industrial Safety Exposition

The second annual Industrial Safety Exposition, under the auspices of the Industrial Commission of Ohio, is being held in Cleveland this week. It was formally opened Jan. 22 with an address by Governor Frank B. Willis and will close Jan. 29. The number of industrial companies making exhibits is considerably larger than at the exposition in Columbus a year ago, and the display as a whole is considerably better, showing the interest that is being taken in the matter of accident prevention by Ohio manufacturers.

Among the largest exhibits are those made by steel companies, which include photographs and safety devices. The United States Steel Corporation occupies considerable floor space. Other steel companies represented are the Republic Iron & Steel Company, Youngstown Sheet & Tube Company, Whitaker-Glessner Company, Portsmouth Steel Company and American Rolling Mill Company. The safety devices and equipment exhibited cover the field of accident prevention, fire prevention, industrial sanitation and industrial health.

The State of Ohio is represented by exhibits made by the Ohio Industrial Commission and the division of industrial hygiene of the State Board of Health, which uses stereopticon views to illustrate industrial health hazards. The Youngstown Safety Council, Youngstown, composed of manufacturers in that city and vicinity, and the Safety Council of the Columbus Chamber of Commerce also had exhibits as well as the National Safety Council. One exhibit that attracted considerable interest was composed of models of underground iron-ore mines in the Lake Superior district, showing in miniature form the safety devices there used. This exhibit was made by Pickands, Mather & Co., Cleveland. A large exhibit by the B. F. Goodrich Company, Akron, included a model rest room, model dental clinic and model dispensary.

In connection with the exhibition, round table conferences on accident prevention are being held daily in one of the rooms adjoining the exhibition hall. Among the topics thus far discussed are "Companies' Experiences in Accident Prevention," "Industrial Sanitation and Hygiene," "The Importance of Shop Rules in Accident Prevention," "The Employer and Safety" and "How to Profit by Near Accidents." Among the companies represented with exhibitions, in addition to those referred to above, are Chandler & Price Company, Cleveland Fabric Belting Company, Northern Blower Company, Otis Elevator Company, Strong, Kennard & Nutt Company, Thompson Electric Company, W. S. Tyler Company, William Platz Company, John A. Roebling's Sons Company, and Brown Hoisting Machinery Company, all of Cleveland; American Car & Foundry Company, Chicago; Buckeye Steel Castings Company and Ralston Steel Car Company, Columbus; Yale & Towne Mfg. Company, New York; De Vilbiss Mfg. Company, Toledo, and Norton Company, Worcester, Mass.

Ryerson & Son Entertain Employees

The annual Christmas dinner tendered the Ryerson salesmen and office executives of the Chicago plant by E. L. Ryerson, chairman of the board, and Clyde M. Carr, president of Joseph T. Ryerson & Son, was held at the Hotel LaSalle, Chicago, Dec. 29. During the Christmas holidays, also, Joseph T. Ryerson, treasurer, and W. H. Eulass, New York manager, acted as hosts for the house at a dinner of the sales and office organizations in that city at the Hotel Astor. A. M. Mueller, St. Louis manager, was host at the dinner given his salesmen and office executives.

The Luther Grinder Mfg. Company, 285 South Water Street, Milwaukee, Wis., elected the following officers at the annual meeting of stockholders: President, C. J. Luther; vice-president, S. S. Newton; secretary, W. W. Newton; treasurer, L. L. Newton; directors, Franklin P. Mann, A. J. Benjamin and George E. Morton. The plant is operating at 100 per cent capacity and has bookings to insure operations on this scale for at least twelve months.

Southern Rates on Wire and Strips

WASHINGTON, D. C., Jan. 25, 1916.—The Interstate Commerce Commission has directed the railroads in Southern Classification territory to prepare a more definite classification for flat wire; bar, band, hoop, rod and flat iron; and cold-rolled or drawn steel, flat, and other similar products. The commission suggests that the roads should give prompt consideration to this matter through the Southern Classification Committee and after public notice and hearing in order that much confusion now prevailing may be obviated. The action of the commission is based upon its consideration of the case of the American Steel & Wire Company vs. Alabama & Vicksburg Railway Company, et al., in which the complainant sought to secure the cancellation of certain features of the carriers' classification describing flat wire. Wire in carloads in the Southern classification generally takes commodity rates two-thirds of the sixth class, although in the absence of special commodity rates the rate applied, both carload and less than carload, is the sixth class rate.

Prior to April 20, 1914, the classification description made no distinction between round and flat wire. On that date the item relating to the classification of wire was changed by the addition of a note as follows: "Flat wire, ¾ in. or greater in width, will be rated same as sheet-iron plates or strips n.o.s." Sheet-iron plates or strips not otherwise specified are rated less than carload fourth class, and carload, minimum weight 30,000 lb., sixth class. This note thus increased the rates on flat wire of a width of ¾ in. and greater, in carloads, from two-thirds of sixth class to full sixth class, and on less than carloads from sixth to fourth class. Prior to the effective date of the classification change, the American Steel & Wire Company filed a protest seeking to have the tariff suspended. Since the case was heard and argued the carriers have filed Southern Classification No. 41, I. C. C. No. 20, in which the note objected to by the American Steel & Wire Company does not appear. A new item has, however, been added reading as follows:

Cold-rolled or drawn steel, flat:	
In barrels, boxes, or crates, or in burlapped coils or bundles, less than carload	Fourth class
In packages named, straight or mixed carload, minimum weight 30,000 lb	Sixth class

In view of the action of the carriers in abandoning the rule of April 20, 1914, the commission has dismissed this complaint but takes occasion to draw attention to the general confusion that prevails as the result of vague and ambiguous terms employed in the classification and to direct a general revision of the tariffs on these products throughout Southern Classification territory. It is understood that the carriers are preparing to execute the commission's order and at an early date will give notice of the proposed hearings. W. L. C.

National Scrap Association's New Officers

The National Scrap Iron and Steel Association held its second annual meeting Jan. 18 at Hotel La Salle, Chicago, and elected officers as follows: President, E. A. Schwarzenberg, Cleveland; vice-president, I. Wilkoff, Youngstown; secretary, A. J. Bialosky, Cleveland; treasurer, Myron A. Cohen, Cleveland. The Central Division elected the following: First vice-president, Harry S. Grant, Detroit; second vice-president; A. Rotter, Cleveland. Directors: Joe Maher, Buffalo; B. Ginsburg, Detroit. The Western Division elected the following officers: Chairman, M. M. Lieberman, Chicago; secretary, Fred Mayer, Chicago; first vice-president, W. K. Kenly, Chicago; second vice-president, Louis Bornstein, Indianapolis. Directors: Louis I. Bregman, Chicago; James S. Miller, Chicago.

The New Orleans Steel & Iron Company, Audubon Building, New Orleans, La., has been incorporated with $100,000 capital. B. W. Seidel is president; Charles Bedell, vice-president; W. L. Poer, treasurer, and D. J. Reiley, secretary. A mill of 1500 tons monthly capacity is projected, to utilize scrap.

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Government Armor Plant Inquiry

(*Continued from page 255*)

The mill would, therefore, earn per year..... $1,400,000.00
The average total selling price of armor plate produced in a year was only 3280 tons, at $432.62 ..... 1,418,993.60
So the armor plate would have had to cost absolutely nothing to manufacture to produce the same profit as an equivalent investment in an ordinary rolling mill.

Referring to the reports by the Niles and Tillman boards of the shop cost of producing armor, Mr. Grace stated that the Tillman figure of $262.79 as a base price was fairly accurate, and that it was probably within 10 per cent of the present cost. The accuracy of the board's figures, he said, was due in a measure to the fact that the board had plenty of expert assistance and that the armor manufacturers had also supplied much data.

THE QUESTION OF A FAIR PROFIT

In reply to questions by Senator Swanson, Mr. Grace said that it was exceedingly difficult to fix a figure that might be said to represent a "fair profit" on armor plate. Senator Penrose suggested that the determination of a fair profit was rendered somewhat difficult because of the fact that improvements are constantly being made in the processes, rendering it necessary to discard obsolete equipment, a statement in which Mr. Grace concurred, adding that unforeseen complications were constantly arising which made it impossible to apply the same rules that would prevail as to the ordinary commercial business. For example, he cited the fact that whereas during the past year the Bethlehem Company should have passed all its armor with 13 ballistic tests, as a matter of fact 22 were required, and in the procedure one entire group of armor was lost because it did not pass. Specifications, he said, were becoming steadily more severe.

The following interesting colloquy then took place between Mr. Grace and Senator Swanson concerning the desirability of a change in the present policy of letting contracts for armor so as to place it all with one manufacturer in the expectation that by running the plant at full capacity the lowest possible cost would be obtained:

MR. GRACE: If we could run our plant full capacity it would give us the most economical operation, but it is rather hard to conceive that with three plants similarly equipped, and probably operated with about the same efficiency that it is going to be possible for any one plant to enjoy all the business of the United States Government, and I should hope that the United States Government would not consider it a good policy to give all of their business to any one plant, if they want a real national defense situation existing at home.

SENATOR SWANSON: Would you prefer bidding for 10,000 tons, the full capacity of your plant, and run it at the full capacity with all these overhead charges, than to simply have a portion work one-third or one-half?

MR. GRACE: I would prefer to run my plant at full capacity, but I would not prefer to have the United States Government put the armor-plate business on a highly competitive basis, because I would then know I could not run my plant some years.

SENATOR SWANSON: That would be the survival of the fittest policy?

MR. GRACE: That would be the survival of the fittest policy, yes; and that is just the reason that somebody's fingers would get burned.

SENATOR SWANSON: The survival of the fittest policy would give the best armor plate, finally, for the defense of the country?

MR. GRACE: I question that. No; that would not develop the best quality of armor. The present basis is calculated to give the best quality of armor.

MR. SWANSON: The quality of armor is established by the Navy Department, anyway. You have got to make it up to their requirements, and it must pass their tests; and, as I understand it, they have their inspectors to pass it, and when you satisfy the inspectors you then get acceptance, and consequently, if it is properly inspected and proper specifications have been provided, there is very little opportunity for any fraud.

MR. GRACE: You well qualified the remark by saying "proper specifications," because it certainly would not be proper if specifications were prepared which were impossible of being met. We have got one situation like that to-day. We have a condition which is now impossible to meet at Bethlehem. We have taken contracts from the present Secretary of the Navy's administration that our product would pass his specifications under which we are to-day accruing penalties at the rate of $25,000 a month because we can not make the product to meet his specifications. Is that a good, logical, common-sense business situation to be created in this country? We have not been able to pass an armor-piercing projectile for the United States Government for large-sized projectiles for the last two years because we have a specification which is impossible for us to meet. We have gone our very length; we have spent all kinds of money, and we are to-day accruing penalties at the rate of $25,000 a month, and we cannot see our way out at all. Is that a proper condition to exist?

AMOUNT OF ARMOR REQUIRED NEXT FIVE YEARS

Chairman Tillman placed in the record a memorandum furnished by the Navy Department showing the approximate amount of armor required for the five-year program for the improvement of the National defense which has been submitted to the House Committee on Naval Affairs. The total amount involved is 113,200 tons to be delivered as follows: 1917, 26,600 tons; 1918, 17,000 tons; 1919, 21,800 tons; 1920, 26,000 tons; 1921, 21,800 tons.

Commenting on these figures, Mr. Grace said it would make a great difference with manufacturers as to whether they received continuing contracts on the basis of the five-year program or were obliged to proceed as at present. "If you take the present selling price of armor at $425 per ton," said he, "on the basis of our present average business of 3300 tons a year you will have a total selling price of $1,400,000, and I respectfully submit that if the whole selling price were profit we would get but 20 per cent return on the plant investment, which must represent interest charges and depreciation, as well as profit, even if it cost us nothing to make the armor." In concluding his testimony Mr. Grace made an appeal for fair treatment for the armor makers. He said:

Give us a chance before you put us out of existence. Find out what your program is going to be, if you can, and when it is developed, I think I can promise this committee that if they will develop their program we can satisfy them. There certainly is some point where it would not pay the United States Government, even in the most optimistic frame of mind, to build an armor-plate factory; and we will try our best, from a Bethlehem standpoint, to go a long way toward meeting those views, if you will only give us a chance when you are ready. When you are ready to do business, we will see if we can not satisfy you.

When pressed to state a price at which the Bethlehem Company would furnish armor on certain conditions, Mr. Grace said that he could not quote an exact figure at this time, but intimated that rather than abandon its armor-plate plant the company would make a substantial concession, especially if a continuing program of construction should be decided upon, which would enable the armor-plate makers to operate their plants on the most economical basis.

Testimony of Midvale Steel Company

Mr. Barba, vice-president Midvale Steel Company, gave an interesting history of the development of the process of armor-plate manufacture and described the difficulties and discouragements encountered by his company in inducing the Navy Department to consider its bids, no less than five of which were submitted before a single contract was awarded. In reply to questions as to the cost of producing armor at the Midvale plant, Mr. Barba said that Mr. Dinkey would present some carefully prepared figures on the subject and that the company would permit any reputable certified public accountant to go over its books on the sole condition that the figures thus obtained would be held in confidence by the committee and not published broadcast.

Mr. Dinkey read to the committee a statement of reasons why the Government should not go into the armor-plate business. Referring to the report of the so-called Tillman Board that a 10,000-ton Government armor-plate plant, when operating at full capacity, could produce armor at $262.79 per ton, he said:

We submit that it is not fair to make any comparison between this figure and the selling price of armor plate, for the following reasons: (a) This figure can be said to exhibit

only the direct factory costs. (b) In order to institute a fair comparison, the following items should be added, namely, depreciation of plant and equipment, taxes and insurance, and administrative expenses.

ACTUAL EXPERIENCE AT MIDVALE

"Based on actual experience at Midvale," Mr. Dinkey continued, "we estimate that the sum of the above charges would amount to about $54.30 per ton, based on working at full capacity, which, taking the committee's figures as a basis, would bring the total actual cost to $317.09 per ton. The base price on the last bid submitted was $425 per ton, leaving on the above basis an estimated profit of $107.91 per ton. Assuming that our plant would operate at full capacity (7500 tons per year) this would represent an annual profit of $809,325. Our investment in this business is approximately $6,500,000, so that the above return would represent a little less than 12½ per cent on the investment. However, during the last twelve years, the Government has used our plant to the extent of a little less than a total of 44,000 tons of armor, equal to 3584 tons per year. On the basis of this average tonnage, our calculation shows earnings of $386,748 per year, equal to a little less than 6 per cent on the investment, which we submit as a very low percentage of profit on this difficult and hazardous business.

"We regret that it is necessary to call your attention to the fact that all of the costs are not exhibited in the above figures, for the reason that there have been periods when the plants have had nothing to do, and have, therefore, carried idle expenses forward to be divided against future contracts. You may be surprised to learn that this is the situation at the present moment. Owing to the highly technical character of this business, in order to retain an efficient organization, we are compelled to carry on our payrolls a number of high salaried officers and operatives, even though the plants may be shut down as they are at present for the lack of orders. We finished casting steel on our latest contract last October and at the present moment are without orders on which to operate this department.

HIGH INITIAL COST OF EQUIPMENT

"In considering this question, account should be taken of the high initial cost of the large units of equipment required to handle this heavy work, such as immense hydraulic presses, planing and boring machines, etc. As an instance, we are now considering the installation of a second forging press, the cost of which when installed, with its complement of furnaces, pumps, cranes, etc., will be approximately $1,500,000. In the absence of orders for armor plate, these tools would not be suitable for any class of commercial forging and would, therefore, of necessity, remain idle.

"While you will look upon my statement as being made from the standpoint of self interest, nevertheless I believe that you should know that the existing armor-plate plants have almost nothing to do and will probably be idle the most of this year. Producing capacity exists for a larger annual program than has ever been undertaken and if increased capacity is desired, we will, in the future as in the past, respond promptly to the demand.

"The question of a reasonable price for armor has been before some of the members of this committee a great many years. You know how widely the tonnages which you have had to place have fluctuated and you are fully aware of the costs incurred when a plant of this kind is compelled to stand idle. I know I need make no argument before this committee of the blighting effect upon the good of any factory, regardless of what it is making, if, either through the acts of the buyer or the seller, the operations are permitted to be conducted at a loss.

"Difficult as our problems have been, still we have been able to keep available more than enough capacity to supply all your needs. I submit that the solution of the question of a satisfactory price is no more difficult than was the question of an increase of capacity, if both parties at interest will approach the matter in a spirit of fairness. I am sincerely offering our co-operation with any reasonable agency which this committee is willing to employ to dispose of what seems to me to be the only question between us."

COMMITTEE SEEKS PUBLICITY OF COST SHEETS

Mr. Dinkey was cross-examined at great length by members of the committee, who insisted that he should furnish his manufacturing costs in detail without any restriction as to their publication. In reply he said that he had caused to be prepared by Barrow, Wade, Guthrie & Co., public accountants, a statement of the exact costs of the armor made by his company under two complete contracts and that he would submit the information to the committee for its own use but not for publication, and would also furnish the same data to the Secretary of the Navy. Manufacturing costs, he said, were highly confidential details in any industry and his company had never been able to obtain them as to the business of foreign armor-plate manufacturers. It was not fair, he contended, that his company should be required to put such information into a printed public document for the benefit of all competitors, present and prospective. In reply to questions Mr. Dinkey said he was willing to state that his shop cost under the two contracts referred to was materially in excess of the manufacturing cost of the Tillman Board for a plant running at full capacity, a fact which he attributed to conditions in the plant while running at from one-third to one-half full capacity.

Admiral Strauss, chief of the Ordnance Bureau of the Navy Department, testified briefly concerning the methods employed in securing data upon which the estimates of the Tillman Board were based. He insisted, however, that the board's figure of $262.79, which was quoted by the armor-plate manufacturers as shop cost, included every item of expense the Government would be called upon to meet except the salaries of a single naval officer and a stenographer. Mr. Grace thereupon informed the committee that he would be compelled to revise his original statement in which he accepted the figure of the Tillman Board as being accurate for shop cost, and insisted that the Government should make some allowance for the cost of capital invested and for depreciation in addition to the mere upkeep item embraced in Admiral Strauss's estimate.

Mr. Dinkey, in reply to questions, stated that it would require the Government from three and a half to four years to build an armor-plate plant and that the present was a most unpropitious time to embark in such an enterprise because of the high cost of materials and the difficulty of procuring heavy machinery at any price. Admiral Strauss admitted that the Government might have much difficulty in obtaining the necessary equipment and added that considerable losses might be incurred in the experimental stages of the project. The chief advantage the Government would gain by the establishment of a plant, he said, would be its power to regulate the price of the armor it might buy, but he also thought improvements in methods of manufacture would be apt to result from Government competition with the private manufacturers.

On a motion by Senator Penrose, the committee adjourned until Feb. 1 to give the armor-plate manufacturers an opportunity of conferring with Secretary Daniels. W. L. C.

A New Rogers-Brown Freighter

The Buffalo Steamship Company, which is connected with the Rogers-Brown Iron Company, carrying the iron ore consumed by the Buffalo furnaces of the latter, has placed a contract with the Great Lakes Engineering Works, Detroit, for the building of a vessel 600 ft. long and 60-ft. beam, with a carrying capacity of 12,000 tons of ore. The time of delivery is April, 1917, which is the earliest time now named by Lake shipyards for deliveries on new orders.

The Curtis Pneumatic Machinery Company, St. Louis, Mo., has been awarded a contract for fifty-five Curtis single, one-beam, overhead traveling cranes, equipped with Sprague electric hoists, to be installed in the new foundry of the Buick Motor Company, Flint, Mich.

HIGH AND LOW CARBON RIVETS

Comparative Value and Properties Under Different Practical Conditions

In a paper read recently before the Japanese Institute of Naval Architects, Yasushi Taji, assistant constructor to the Imperial Japanese Navy, describes a number of comparative experiments on rivets of ordinary mild steel and of high tensile steel. The mild steel used was of Japanese manufacture, containing about 0.21 carbon, 0.02 silicon, 0.46 manganese, 0.011 phosphorus and 0.039 per cent sulphur, with a tensile strength of 25 tons per square inch, and an elongation of 31 per cent. The high tensile steel tested was in part of British make, analyzing approximately 0.41 carbon, 0 silicon, 0.51 manganese, 0.022 phosphorus and 0.039 per cent sulphur, with a tensile strength of 40.2 tons, and an elongation of about 20 per cent. The remainder was of Japanese make containing about 0.36 carbon, 0.145 silicon, 0.89 manganese, 0.009 phosphorus and 0.0308 per cent sulphur, its tensile strength being 35.8 tons, with an elongation of nearly 30 per cent. Among the matters investigated was the best temperatures for the heating and finishing of the rivets, since it was thought possible that high tensile steels might be peculiarly susceptible to the influence of an improper heat treatment.

The rivets used were specially made for the purpose, with a view to obtaining an accurate record of the temperature at which the material entered and left the rivet-making machine. To secure uniformity in this regard, the rivet bars were cut in halves and not more than six rivets were made from one piece. The rivets, after reheating to different temperatures, were closed either by hand, pneumatic or hydraulic power, in a special jig designed to permit of the closed and finished rivets being easily removed for examination test, etc. The rivets in this series of experiments were 1⅛ in. long and 3/10 in. in diameter, while shear test specimens were ¾ in. square and 3 in. long.

FINISHING TEMPERATURE AND PHYSICAL PROPERTIES

The shearing strength of the finished rivets proved to be almost invariably greater than that of the raw material, even when the former had been somewhat overheated. The tensile strength of the mild steel specimens seemed to be little affected by the finishing temperature, but about 650 deg. C. appeared to be on the whole the best. The elongation, on the other hand, varied considerably, the loss being a maximum when the finishing temperature was about 750 deg. C., and least at about 650 deg. C. Very little variation was found in the yield point. With the high tensile steels higher temperatures gave better results, the loss of elongation being least when the rivets were finished at 750 deg. C., and the yield-point was also affected by the temperature, being higher the lower the finishing temperature. A finishing temperature as high as 750 deg. C. is, Mr. Taji states, difficult to secure in the case of rivets closed by hand or by pneumatic riveters, and hence when high tensile steel rivets are used, he suggests that they should always be closed by an hydraulic machine. Moreover with the latter satisfactory work can be secured with rivets less highly heated *ab initio*. An initial temperature of 900 deg. C. is therefore recommended for high tensile steel rivets driven hydraulically, while mild steel rivets similarly closed may be heated 50 deg. higher. Where, however, hand or pneumatic riveting is employed, mild steel rivets must be heated to nearly 1100 deg. C., and high tensile steel rivets to about 1050 deg. C.

Some further experiments were made to determine whether the high tensile steel rivets would be particularly liable to be snapped off by the shock of an explosion. Comparative tests of high tensile and mild steel rivets stressed by exploding powder in a closed chamber showed, however, the superiority of the former material, while they also made evident the advisability of finishing rivets, which may be exposed to such shocks with heads rather thicker than ordinary practice.

DISTORTION IN CLOSING

Further experiments were made to determine the distortion of the rivet during the operation of closing it, a special machine being arranged for the purpose. The experiments were made on cylindrical pieces of rivet bars, which were upset in various ways, and the position and diameter of the stoutest section determined at different periods during the operation. When upset by hand-riveting hammers, the stoutest section was always close to the hammer, from which the conclusion is drawn that hand riveting is particularly well adapted for filling up countersunk holes. When the upsetting was effected by pneumatic hammers the swelling was greatest at some point nearer the mid-length of the specimen, the distance of which ranged in different cases from 15 mm. to 28 mm. from the top. The swelled section being, as stated, near the middle of the rivet, holes are better filled than with hand riveting. From the observations made in this series of experiments, Mr. Taji concludes that in penumatic riveting the hammer used should be capable of closing rivets ⅛ in. larger than those for which it is used. With hydraulic riveting the holes are still better filled, since the rapid cooling of the ends in contact with the heads of the riveting machine causes the swelling to be concentrated in the shank of the rivet.

The superiority of the hydraulically closed rivets was further shown in experiments carried out on the tightness of joints made with 1-in. to 1⅛-in rivets connecting three thicknesses of 1-in. plate. With both ends of the rivet countersunk, the order of merit was hydraulic, hand, and pneumatic; but it is stated that the latter would have equalled the hand method had the available air pressure been higher. When, however, neither end of the rivet was countersunk, hand riveting proved much inferior to either of its rivals. With but two thicknesses of plate in the joint, instead of three, the relative inferiority of the hand driven rivets was comparatively slight.

In certain cases the use of long rivets cannot be avoided and it is then difficult to insure that the holes shall be properly filled. Mr. Taji has, however, got excellent results in such cases by reaming the holes to a hyperbolic contour.

Record Pig-Iron Exports

Pig-iron exports from the United States are now at almost record rates, which was in the fiscal year of 1913. Government statistics show the following:

	Gross Tons	Gross Tons per Month
August, 1915	18,567	
September, 1915	29,222	23,000
October, 1915	21,212	
10 months ended Oct. 31, 1915	178,141	17,814
10 months ended Oct. 31, 1914	97,538	9,753
10 months ended Oct. 31, 1913	233,855	23,385
Fiscal year ended June 30, 1914	201,995	16,833
Fiscal year ended June 30, 1913	287,022	23,919
Fiscal year ended June 30, 1911	152,807	12,734
Fiscal year ended June 30, 1910	79,771	6,647

The present rate of 23,000 per month, as judged by the last three months for which published data are available, compares with 23,919 tons per month in the record fiscal year of 1913. The low point was attained in the fiscal year of 1910 at 6647 tons per month. Unusual demand from foreign countries, that used to obtain their supplies from European countries, is the cause.

British exports have decidedly declined in contrast. In 1913 to Nov. 1 total pig-iron exports were 793,294 gross tons, but for the same months in 1915 they were only 368,408 tons, or a decrease to less than half. British pig-iron imports to Nov. 1, 1913, were 174,430 tons, as against 164,305 tons to Nov. 1, 1915, which indicates little change due to war conditions.

The Rich Twist Drill Company, Chicago, has been organized by George R. Rich, with a shop at Forty-fifth Avenue and West Congress Street. The company will continue the manufacture of twist drills and of other metal-cutting tools in the lines with which Mr. Rich has previously been associated.

PLAN FOR NATIONAL DEFENSE

W. L. Saunders Points Out That Dependence on Industry Is Inevitable

W. L. Saunders, chairman of the board of the Ingersoll-Rand company, addressed the New York Trade Press Association, Jan. 20, on "Industrial Preparedness," to which, as a member of the Naval Consulting Board, he has given a great deal of study. The question of industrial preparedness in the sense that as an industrial nation we must be prepared to repel competition arising from the possible dumping of foreign-made goods at low prices in this country after the war was dismissed by Mr. Saunders in a few words. It was not that kind of preparedness he had in mind. It was his belief that we should have little to fear from the shattered nations of Europe when peace is restored, and that no governmental support will be necessary to protect our industries. We should rather, in his opinion, endeavor to help these crippled nations get on a basis where they can buy from us, and so establish the exchange of commodities which is the life of healthy international trade. Mr. Saunders said, in part:

MEANS MORE THAN SHELL-MAKING

More important than trained soldiers, guns and warships is the question whether or not the industries of the United States are organized, co-ordinated and prepared to respond in full and effective measure to the call of the Government.

Industrial preparedness means something more than mere capacity to make shells. It means first a knowledge and classification of the coal, iron and other mineral resources of the country and the protection of these resources at the source. It means a knowledge of the capacity of the mines and mills and the extent to which they are able to respond when called upon. It means, further, a knowledge of the capacity of every industry which may be capable of supplying things that are needed for the sinews of war. This covers a wide field, from food and clothing to hospital equipment, motors, animals and telephones, telegraph and railroad accommodations. It also means that the Government should not only know where these industries are and what they can do, but those in control of the industries should know what is expected of them; that is, the exact nature, as well as volume, of the requirements.

The spirit of our people is one of vital energy and success. Every man in industry is a general with initiative to go forward on lines which he frequently thinks out. This is carried to so great an extent, that being a free country, without centralized control or direction, we have become careless, loose in co-operation, unresponsive to orders and weak in our capacity for military service.

COLLECTIVE EFFORT NOW RULES

We must not lose sight of the fact that the unit of efficiency in the world is no longer the individual, either in industry or on the firing line, but it is the capacity of that individual to command and exert through organization the maximum efficiency in the mineral and industrial resources of the nation. Our great growth in wealth is due mainly to the collective action of individuals, to machinery, which multiplies the labor of one man ten to twenty times.

The best and biggest organization is usually the most efficient and the most successful. Germany, being under autocratic control, is in a position to direct quickly her industrial energies for either peace or war. It is one of the weaknesses of democracy that its people and its industries are not in times of peace so co-ordinated as to be thrown readily into gear for military service.

What is the remedy? Is it to enter into the construction of battleships, munitions of war and military training on a large scale? I think not. It is rather to begin at the bottom, as the Naval Consulting Board has proposed, by establishing in every State of the Union an organization, acting through the five largest scientific societies, in first finding out where the mines and the works are located, what capacity they have for service in time of trouble, and through this information bringing the Government so closely in touch with them that they may be prepared to respond when called upon.

GOVERNMENT SHOULD SUSTAIN INTEREST

Small Government orders given annually at practically no profit to the manufacturer, but sufficient to keep him tuned up, is an important feature of preparedness. An order for ten shells a year, for instance, built on Government specifications, at a price current at the time, will call for an equipment of gages which may be held on the shelves ready for use. The men at the works will in this way have their attention directed to the subject; some will know how to make them, because they will be expected to do this work at intervals, and so every industry that is capable of serving the Government, and everything that goes into the common term munitions of war will be co-ordinated and a peaceful machine will be created requiring only the opening of the throttle to be set in motion for the common defense.

Railroad Car Business

High prices, coupled with the belief that railroads have not had a sufficient amount of profitable business to offset them, are now regarded as a substantial check to very active buying of railroad cars, however much they may be needed. The present opinion is that orders for cars will proceed slowly for some weeks.

The Baltimore & Ohio has placed 3000 cars, 1000 with the American Car & Foundry Company and 2000 with the Cambria Steel Company, and in some quarters it is believed more are yet to be bought. The Standard Steel Car Company is to build 1000 tank cars for the Union Tank Line and the Pressed Steel Car Company 100 gondolas for the Bethlehem Steel Company, while among recent car orders not heretofore reported is one for 1000 box cars for the Denver & Rio Grande placed with the Pullman Company. Besides the cars for Russia, which have been under consideration for a long time, buying is expected by the Southern Pacific and possibly the Union Pacific; and by the Southern Railway of 1000 cars for the Queen & Crescent. These, with the 2000 ore cars for the Bessemer & Lake Erie and the 1300 freight cars and 94 passenger equipment cars for the Illinois Central, make a total of over 12,000 cars before the market.

Locomotive Orders Large

Orders for 172 locomotives have been reported placed in the past week, which make a total of 227 thus far this year. The Pennsylvania Railroad has ordered 60 shifting and 45 freight locomotives from its own shops. The Erie has ordered 10 Santa Fé locomotives from the American Locomotive Company and 10 of the same type from the Baldwin Locomotive Works. The Union Pacific has contracted for 10 and the Lehigh Valley for 15 switching locomotives with the Baldwin Locomotive Works, which company has also taken a large number of small orders for the remainder of the total.

The Standard Crucible Steel Casting Company, Milwaukee, Wis., of which F. M. Weis is president, is installing a 2-ton open-hearth furnace. This furnace was designed and is being installed under the direction of David McLain, consulting engineer, and is guaranteed to melt five 2-ton heats in 12 hr., although easily capable of melting 3 tons to the heat. The furnace is built with a very shallow hearth and will burn fuel oil.

The Newport News Shipbuilding & Drydock Company, Newport News, Va. and the New York Shipbuilding Company, Camden, N. J., have signed contracts with the Netherlands Engineering Company, Amsterdam, Holland, for the construction under license in the United States of the Werkspoor four-cycle, Diesel type motors, according to T. Orchard Lyle, representing the Netherlands Company in this country.

Customs Decisions

COPPER SHEETS

The Board of General Appraisers has handed down a decision construing the copper sheet and metal provisions of the tariff favorable to importing interests. The case before the tribunal was that of O. G. Hempstead & Son, who as forwarders made entries at New York and Philadelphia. The merchandise in controversy consisted of copper sheets with surface measurements, in inches, of 15 x 36, 17 x 28, 12 x 36, 20 x 24, 18 x 36 and 22 x 28, some being 16 and some 18 gage in thickness. Duty was levied at 20 per cent under the present act, as "manufactures of metal not specially provided for." The importers went before the board with two claims, one for free entry under paragraph 481, as "copper in plates not manufactured or specially provided for," and the other calling for a duty of 5 per cent under paragraph 147 as "copper in rolled plates, called braziers' copper, sheets, rods, strips and pipes." Judge Fischer said that the board was fully satisfied from the testimony and the samples that the merchandise was copper sheets dutiable as claimed in the alternate contention. The free list claim was not regarded as applicable. The collector was reversed in his levy under the metal "catch-all" paragraph.

NICKEL STEEL BARS

Adverse action was taken by the board in protests by H. T. Potts & Co., relating to the classification under the act of 1913 of nickel steel in bars. The collector returned the merchandise at 15 per cent under the provision for "steels by whatever process made, containing alloys such as nickel." The importers claimed classification under paragraph 155, reading "nickel, nickel oxide, alloy of any kind in which nickel is a component of chief value, in pigs, ingots, bars, rods, or plates," and called for 10 per cent duty. Judge Fischer said that, in order to prevail at all, it was incumbent on the protestants to establish the fact that nickel was the component material of chief value in the merchandise. As there was an absolute failure on the part of the importers to do this, the collector was affirmed.

GRINDING MACHINES FOR CARD CLOTHING

Leigh & Butler imported at Boston Dronsfield patent traverse wheel grinders and Dronsfield patent rollers, both of which are designed for grinding card clothing, for which purpose they are attached to a carding machine which furnishes the motive power to operate the grinders. The collector returned the machines at 20 per cent as metal manufactures not specially provided for, whereas the importers asked entry at 15 per cent as "machine tools." As the machines were shown to be equipped with metal-working apparatus, the board held they fell under the provision claimed, the collector being reversed. The board took similar action in a protest by McRae & Keeler, who brought in chain-making machines at Providence.

SCRAP APPLIES TO NEW DEFECTIVE MERCHANDISE

The principle was laid down in the protest case of the Loomis Scrap Iron Company that importers are not required under the tariff law to pay full duty on defective merchandise even if new. The importation in controversy consisted of unused butt-welded iron and steel pipe which came from the mill defective for high-pressure purposes. The appraiser stated in a report to the board that old steel pipe had a market value of from $5 to $9 per ton, but that the purchase price of the steel pipe involved in the protest indicated that it was of a much higher grade than scrap pipe. He also reported that an investigation conducted by the customs authorities revealed that it entered into consumption as pipe, being cut into lengths and used as guard rails, fence posts, rollers, building columns or supports and lawn fences. The collector accordingly levied duty at 20 per cent under the provision in paragraph 127 for "lap-welded, butt-welded, seamed, or jointed iron or steel pipes." The importer claimed that out of a total shipment of 71,387 lb., only 24,274 lb. of the pipe was fit to withstand steam or water pressure. As to this the importer made no protest, but asked that the other 47,113 lb., being unfit for the use for which manufactured, should be given free entry under paragraph 518, as fit only for remanufacture. Judge Fischer sustained the claim and ordered the collector to make a reliquidation.

HACK SAW TOOTH-SETTING MACHINES

The board refused to consider hack-saw tooth-setting machines imported by Darwin & Milner at New York as "machine tools" within the meaning of the tariff. From the testimony it appeared that the machines are driven by electric power, and that their sole function is to bend or set in opposite directions the teeth on hack saws. One of the witnesses called in behalf of the importers testified that each machine contains two cog wheels, which press alternately one tooth down and another up. The board held there was nothing in the record to show that the cog wheels in the machines were "tools." The 20 per cent duty as metal manufactures not specially provided for was affirmed.

FREE VESSEL EQUIPMENT FOR GOVERNMENT

The board has decided that wireless equipment ordered by the United States through Kennedy & Moon, New York, for installation on the vessels of the Government-owned Panama fleet of steamships is not dutiable under the provision in the present tariff for "manufactures in chief value of metal not specially provided for." The collector was reversed in taking 20 per cent duty. Judge Hay, construing the law, said that the subsections in controversy were intended to provide for the free entry of all articles of foreign production needed in the equipment of vessels owned by the United States.

BRONZES NOT MADE BY ARTISTS

The board, following its announced purpose of not allowing bronze statuary to enter at 15 per cent as "sculptures" unless absolute proof is submitted that the merchandise is actually the production of artists, overruled a claim by the Sherwin-Williams Company, Cleveland, Ohio. There have been several attempts of late to bring in bronze productions made in commercial quantities under the provision for sculptures carrying the lower rate, but no encouragement in this direction has been given by the board. The protests of this kind have included articles entered under both the act of 1909 and the present law. The Sherwin-Williams protest just decided arose under the earlier act. The board held that the collector was justified in taking 45 per cent duty under the paragraph for "manufactures of metal not specially provided for."

STEEL BAND SAW PLATES

The custom house authorities at Chicago were reversed in their assessment of duty on saw plates imported by G. W. Sheldon & Co. The appraiser returned the merchandise for duty at 15 per cent under the act of 1913, as "crucible steel sheets suitable for band saws." The importers claimed entry at 12 per cent under the provision in paragraph 105 for "crucible steel band saw plates, cut or sheared to shape or otherwise, or unsheared." In reversing the Chicago classification, the general appraiser said "the uncontradicted evidence shows that the articles are band saw steel plates, and we so find."

STEEL DIE BLANKS

Adverse action was taken by the board on a protest by Hensel, Bruckmann & Lorbacher, New York, in the matter of the classification of die blanks of steel, forged and machined, imported under the present law. The protest claimed that the merchandise was entitled to entry at 15 per cent under paragraph 110, for "die blocks or blanks when made by the crucible process." The decision said there was no proof before the board that the articles in question were made by the crucible

process, but merely the statement of the witness who appeared that that was the way he ordered them. The protest was accordingly overruled, the collector being affirmed in his levy of 20 per cent under the provision for metal manufactures not provided for.

METAL DRUMS AS CONTAINERS

Judging from the attitude of the board in the protest case of A. Klipstein & Co., it will be difficult for foreign-made metal drums to obtain free entry, in competition with American products, during the life of the present tariff law. The goods covered by the protest were described as ten corrugated iron drums used as containers of permanganate of potash, and forty-eight drums holding sulphide of sodium. Duty was levied on both classes of drums at the rate of 20 per cent under paragraph 167, as manufactures of metal not specially provided for. They were claimed to be properly dutiable at the rate applicable to their contents, or free of duty as the usual and necessary containers of the merchandise mentioned above. Judge Fischer said that the importer's evidence failed to controvert the correctness of the collector's classification of the goods as drums which are intended to be repeatedly used as containers of like merchandise. Relief was denied.

Pittsburgh and Nearby Districts

The Sligo Steel Company, Pittsburgh, has been incorporated with a capital of $750,000 to manufacture iron, steel and other metals. The incorporators are George Frankovich, John Robinson and A. A. Allee.

The entire plant of the Republic Iron & Steel Company at Youngstown, Ohio, is now operating to 100 per cent of capacity. In the early part of last week there was a shortage of natural gas, which interfered to some extent with operations of several of the finishing mills, but there is now an ample supply and the mills are again running full force.

At the annual meeting of stockholders of the Brier Hill Iron & Coal Company, held last week in Youngstown, Ohio, directors were re-elected as follows: H. H. Stambaugh, John Tod, David Tod, Fred Tod and J. G. Butler, Jr. Officers of the company were also re-elected: H. H. Stambaugh, president; John Tod, vice-president; R. S. Steese, secretary and treasurer, and J. G. Butler, Jr., general manager.

The Concrete Steel Company, Youngstown, has a contract for furnishing about 700 tons of Havemeyer steel bars to the American Tool Works Company, Cincinnati, Ohio, to be used in its new reinforced concrete buildings. The first shipment on this contract will be made in February.

The C. L. Dorer Foundry Company, Bellaire, Ohio, manufacturer of castings, at its recent meeting of stockholders, re-elected the old board of directors, and officers were re-elected as follows: C. Simpson, president; O. C. Simpson, vice-president; C. L. Dorer, secretary, and P. A. Wimmer, treasurer.

The Pittsburgh Steel Company, Frick Building, Pittsburgh, has issued a statement showing that its sales for the six months ended Dec. 31, 1915, were $9,660,259.48, against $4,137,430.38 for the six months ended Dec. 31, 1914, an increase of $5,522,829.10. Net profits for the six months ended Dec. 31, 1915, were $1,695,108.60, against $117,313.43 for the corresponding period of 1914, or an increase of $1,577,795.17.

The American Manganese Steel Company, Chicago, has established a sales office in room 202, Oliver Building, Pittsburgh, in charge of W. M. Black.

A committee of seven has been appointed to liquidate claims against J. V. Thompson, Uniontown, Pa., the well-known coal and coke operator, whose affairs were placed in the hands of receivers last year. J. A. Campbell, president Youngstown Sheet & Tube Company, is one of the committee, the others being as follows: A Plumer Austin, president Fayette Title & Trust Company, Uniontown; Alexander C. Robinson, president Safe Deposit & Trust Company, Pittsburgh; A. R. Hamilton, director of Commonwealth Trust Company, Pittsburgh; A. F. Cooper, attorney, Uniontown; E. T. Hitchman, president Hitchman Coal & Coke Company, Wheeling, W. Va.; G. S. Harah, director of Second National Bank, Uniontown. The liquidation will be financed by Samuel Untermyer, New York City.

The Stupakoff Laboratories has purchased a site on Hamilton Avenue, Pittsburgh, where a fireproof building, with about 10,000 sq. ft. of floor space, will be erected.

The brief of steel interests in Pennsylvania who are protesting against the proposed railroad carrying rate of 20c. per ton for hauling furnace slag was to be filed with the Public Service Commission of that State Jan. 27. Arguments in the West Virginia slag case are to be heard soon, and a little later will be heard before the Ohio commission.

The Herman Pneumatic Machine Company, Zelienople, Pa., has changed its power plant into a machine shop and has already added new machinery for it. The company was compelled to do this on account of pressure of business. It has been working night and day for six months, all its business being in jarring molding machines for foundry use. Robert R. Ringle is works manager.

The W. R. Miller Company, Pittsburgh, with a capital stock of $5,000, has been incorporated by W. R. Miller, J. Murray Miller and James C. Miller, 607 Boggs Avenue, Pittsburgh, to design and erect furnaces, mills and other manufacturing plants.

The Modern Explosives & Chemical Company, Emporium, Pa., with a capital stock of $50,000, has been incorporated by G. W. Huntley, and others, to manufacture explosives, etc.

The Grebnelle Game & Toy Company, 411 Heed Building, Pittsburgh, with a capital stock of $15,000, has been incorporated by Harry Ellenberger, 1826 Wallace Street, Philadelphia; Paul H. Schollenberger, 337 North Sixth Street, Reading, and others, to manufacture toys and novelties.

The Bethlehem Steel Company, owner of the Titusville Forge Company, let a contract last week for improvements to the plant at Titusville, Pa., entailing an outlay of $300,000. It provides for a material enlargement of the present buildings and the construction of several new ones.

The Youngstown Sheet & Tube Company, Youngstown, will erect a large club house for the use of employees and their families. It will cost about $200,000, and is to be one of the most complete of its kind in the country.

Stockholders of the Harbison-Walker Refractories Company met in Pittsburgh last week and re-elected former directors as follows: H. W. Croft, Hamilton Stewart, C. M. Reif, L. C. Turley, J. J. Brooks, Jr., George W. Reese, H. F. Bigler, J. E. Lewis, T. H. Given, R. W. Harbison, T. L. Chadbourne, Jr., Hay Walker, Jr., Hay Walker, William Walker and N. McQuillen.

Work will soon start on improvements and additions at the yards and docks of the Bessemer & Lake Erie Railroad at Conneaut, Ohio, a subsidiary of the Carnegie Steel Company. It is not expected that they will be completed inside of two years. The yards will be occupied by 100 storage tracks. Conneaut Creek will be diverted nearly 1000 ft., thus giving the company considerable land now under water much of the time. The Bessemer & Lake Erie Railroad carries most of the ore used by the Carnegie Company in the Pittsburgh district.

The Carnegie Steel Company has started work on the building of 200 by-product coke ovens at Clairton, Pa. The exact type of the ovens has not been decided upon, but will be shortly. They will more than supply all the coke used by the three Clairton furnaces and the excess output will be shipped to nearby stacks of the company. The new ovens are expected to be completed within a year. The company is repairing its furnace at Niles, Ohio, which has been idle for some years, and it will probably resume blast within thirty days. This leaves only two of its isolated stacks not in operation, namely, that at Zanesville, Ohio, and a small stack at Steubenville, Ohio.

Iron and Steel Markets

PRICE ADVANCES CONTINUE

Buyers Pressing with Future Offerings

Ocean Freight Rates an Obstacle in Closing on Export Business

The scale of earnings of the United States Steel Corporation, learned through the announcement of Tuesday afternoon, puts the stamp of definiteness on the high level of prosperity of the steel trade as a whole. With prices half again and in some cases twice as high as they were a year ago and a volume of business two to two and one-half times as great as in late 1914, we are still moving in the direction of higher prices. The incessant demand for material booked and the repeated efforts to find takers for the large volumes for export give some indications of the promise of 1916.

There are clouds on the horizon but as yet not portentous. Ocean freight charges twice the seaboard cost of material are making it increasingly difficult to close for desirable export business. High prices are checking new projects, though as yet these total to a moderate volume only and may mean merely deferred consideration in some cases. New buying is on the whole not heavy but this causes the mills no concern with their bewildering piles of orders for months ahead. Labor shortage in different lines is a factor of uncertainty.

The intermittent embargoes are backing up on mill operations, and the increased indefiniteness of delivery promises, augmented on this account, are a deterrent, in addition to high prices, in holding back business.

The price advances are largely due to buyers themselves, who are anxious to have mill positions beyond their present protection, but the mills still resist opening books for much in the third quarter or for anything in the fourth quarter. Meanwhile second quarter rollings are clearly getting forced into the third quarter, so it is perhaps not surprising that consumers are willing to commit themselves even for deliveries into 1917, with the price a secondary consideration.

Generous railroad buying is not expected in the immediate future. Earnings of railroads must be swelled to the levels of ten years ago, it is held, before their pet bridge jobs and cars in quantities will be considered. Raw material prices going into these products are high, but sufficient competition exists so that the high prices of the finished bridge work of 1906, for example, have not yet been reached. It is to be remembered that haulage of freight for export, now a feature, is not done at domestic rates.

Our London cable announces the looked for fixing of prices on steel products, but British steel makers are not willing to sell at those prices and export business is practically suspended. Tool steel is included. Steel plates are put at $54.75 per ton, beams at about $54 and sheet bars at $57.15.

Wire rods have been sold here for export at about $55 per ton, Pittsburgh, and some business has been done in barb wire at $5 to $10 over domestic prices.

A recent export sale of 80,000 boxes of bright plate was done at better than $3.75, Pittsburgh, and $4 tin-plate is regarded as an early possibility. Blue annealed sheets are $3 per ton higher and now practically on a parity with black sheets.

An enormous demand for machine tools from abroad is developing. There is one inquiry from Russia for no less than 3265 machines. Domestic demand is becoming strong and some buyers are arranging for 1917 needs.

Wages to Lake Superior iron-ore miners are to be advanced very generally on Feb. 1 an average of 10 per cent. This is in addition to the recent restoration of the 10 per cent cut made at the time of the depression of something over a year ago.

The rail business of the week came from the Central West. In addition to the 30,000 tons for the St. Paul placed with the Steel Corporation, independent rail makers have received 8500 tons from the same road. Some 15,000 tons were bought by three other roads. Owing to demand and higher steel prices, light rails have been advanced $3.36 per ton. Besides the nearly 70,000 tons of rails for Russia and Italy, delayed in closing partly by the difficulty of securing steamer space at satisfactory rates, upward of 14,000 tons of track accessories for Russia is included.

Early bridge work of size covers 14,000 tons in Kentucky, counting 11,000 tons for the Louisville bridge approaches. Four more Norwegian boats are reported placed at Lake yards, in addition to the four noted last week. Under what urgency some buying has to be done is shown in the sale to an Ohio manufacturer of 2000 tons of structural material out of a Chicago warehouse at 2.45c., delivered.

In pig iron the leading feature is export inquiry for 50,000 tons of Bessemer iron for France and Italy.

Pittsburgh

PITTSBURGH, PA., Jan. 25, 1916.

Advances in prices during the week have been numerous. As high as $175, seaboard, has been paid for ferromanganese; the nominal price of beams is up $1 per ton; light steel rails over $3; blue annealed sheets, $3; wire products, $2; wire fencing, $6; skelp, $2; plates, $3; steel bars, $1; black and galvanized iron and steel pipe, $2 to $6, depending on sizes, and boiler tubes, $4. The steel mills say that buyers are putting up the market on themselves by insisting on the mill's taking orders for second half delivery and even for first quarter of 1917, the mills to fix the prices. The repeated advances do not seem to restrict the anxiety of consumers to cover ahead, but, in most cases, mill's are not willing to sell beyond the third quarter for the heavy hot rolled products, such as plates, shapes and bars. Consumers of sheets are trying to buy for last half, but the mills are refusing to enter the orders. The embargoes on export shipments and to New Eng-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

Pig Iron, Per Gross Ton:	Jan. 26, 1916.	Jan. 19, 1916.	Dec. 29, 1915.	Jan. 27, 1915.
No. 2 X, Philadelphia	$20.00	$20.00	$19.50	$14.25
No. 2, Valley furnace	18.50	18.50	18.50	13.00
No. 2 Southern, Cin'ti	17.90	17.90	17.40	12.40
No. 2, Birmingham, Ala.	15.00	15.00	14.50	9.50
No. 2, furnace, Chicago*	18.50	18.50	18.50	13.00
Basic, del'd, eastern Pa.	19.50	19.50	18.50	13.50
Basic, Valley furnace	17.75	17.75	18.00	12.50
Bessemer, Pittsburgh	21.45	21.45	20.45	14.55
Malleable Bess., Ch'go*	19.00	19.00	18.50	13.00
Gray forge, Pittsburgh	18.45	18.45	18.20	13.45
L. S. charcoal, Chicago	19.75	19.75	19.25	15.75
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh	32.00	32.00	32.00	19.50
O.-h. billets, Pittsburgh	33.00	33.00	33.00	19.50
O.-h. sheet bars, P'gh	35.00	35.00	35.00	20.50
Forging billets, base, P'gh	55.00	55.00	55.00	24.00
O.-h. billets, Phila	42.00	42.00	40.00	21.40
Wire rods, Pittsburgh	45.00	45.00	40.00	25.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	2.259	2.259	2.059	1.20
Iron bars, Pittsburgh	**2.00**	1.95	1.80	1.10
Iron bars, Chicago	**1.90**	1.75	1.75	1.00
Steel bars, Pittsburgh	**2.10**	2.00	2.00	1.10
Steel bars, New York	**2.269**	2.169	2.169	1.26
Tank plates, Pittsburgh	2.25	2.25	2.25	1.10
Tank plates, New York	2.519	2.519	2.419	1.26
Beams, etc, Pittsburgh	1.90	1.90	1.90	1.10
Beams, etc., New York	2.069	2.069	2.069	1.26
Skelp, grooved steel, P'gh	**1.90**	1.80	1.70	1.10
Skelp, sheared steel, P'gh	**2.00**	1.90	1.80	1.15
Steel hoops, Pittsburgh	2.00	2.00	2.00	1.20

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Jan. 26, 1916.	Jan. 19, 1916.	Dec. 29, 1915.	Jan. 27, 1915.
Per Lb to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	**2.60**	2.60	2.50	1.80
Galv. sheets, No. 28, P'gh	4.75	4.75	4.75	2.90
Wire nails, Pittsburgh	**2.20**	2.10	2.10	1.55
Cut nails, Pittsburgh	**2.10**	2.00	1.90	1.50
Fence wire, base, P'gh	**2.05**	1.95	1.95	1.35
Barb wire, galv., P'gh	**3.05**	2.95	2.95	1.95
Old Material, Per Gross Ton:				
Iron rails, Chicago	17.50	17.50	16.00	11.50
Iron rails, Philadelphia	19.50	19.50	19.50	13.00
Carwheels, Chicago	14.25	14.75	14.75	10.00
Carwheels, Philadelphia	16.50	16.50	16.00	11.00
Heavy steel scrap, P'gh	17.50	17.50	17.50	11.50
Heavy steel scrap, Phila.	16.50	16.50	16.00	10.00
Heavy steel scrap, Ch'go.	15.25	15.25	16.00	9.25
No. 1 cast, Pittsburgh	15.75	15.75	15.25	11.25
No. 1 cast, Philadelphia	17.00	17.00	16.75	12.00
No. 1 cast, Ch'go (net ton)	13.00	13.00	13.75	9.00
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$3.00	$3.00	$1.50
Furnace coke, future	2.50	2.50	2.40	1.65
Foundry coke, prompt	3.50	3.50	3.25	2.00
Foundry coke, future	3.25	3.25	3.00	2.15
Metals,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**25.50**	24.00	22.25	14.62½
Electrolytic copper, N. Y.	**25.37½**	23.62½	22.25	14.37½
Spelter, St. Louis	**19.00**	18.25	17.25	7.30
Spelter, New York	**19.25**	18.50	17.50	7.50
Lead, St. Louis	**6.00**	5.70	5.32½	3.52½
Lead, New York	**6.10**	5.90	5.40	3.70
Tin, New York	**42.12½**	40.75	39.25	35.50
Antimony, Asiatic, N. Y.	42.00	42.00	39.50	16.00
Tin plate, 100-lb. box, P'gh	$3.75	$3.75	$3.60	$3.10

land have largely been removed, but there are still some restrictions. The Pennsylvania Railroad insists that when material is loaded on cars for export the shipper must give the name of the boat that is to take it over; otherwise the shipment is refused. The mild weather has helped the railroads wonderfully to get the embargo removed, but if there should be a heavy snow, with delay in traffic, the situation would quickly be as bad as ever. The flurry in prompt furnace coke of last week caused by an extreme shortage in cars is over. The whole steel market continues as strong in every way as at any time, and the demand on the mills for shipments is just as insistent.

Pig Iron.—Local inquiry is dull, but there is heavy export inquiry for Bessemer iron for shipment to Italy and France, this amounting to upward of 50,000 tons. So far little has been done, as there is an acute shortage in the supply of Bessemer iron, and it looks as though prices would be higher. Buyers for foreign interests are offering $22, Valley, for Bessemer without getting it. We quote standard Bessemer iron at $20.50 to $21; basic, $17.75 to $18; malleable Bessemer, $17.50; gray forge, $17.50, and No. 2 foundry, $18.50 to $19, all at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—While there is not much new buying in semi-finished steel, the situation is very strong and the mills are as far back in deliveries as ever, with not much prospect of catching up. Consumers of sheet bars are trying to cover for second quarter, but in most cases the mills refuse to sell so far ahead. We quote Bessemer billets and sheet bars at $32 to $33 and open-hearth billets and sheet bars at $33 to $35, maker's mill, Pittsburgh or Youngstown district. We quote forging billets at $55 to $56, for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 and up to 0.60 carbon take $1 per ton extra.

Ferroalloys.—Shortage in the supply of ferromanganese for prompt shipment has developed, and one consumer that was in dire straits for some prompt ferromanganese paid $175, seaboard, for 100 tons and was glad to get the material. The nominal price of English 80 per cent is $125, seaboard, with no guarantees as to deliveries, but prompt English or domestic would readily bring $140 to $150. We quote 50 per cent ferrosilicon for delivery through all of 1916 as follows: Up to 100 tons, $85; over 100 tons and up to 600 tons, $84, and over 600 tons, $83; all per gross ton, delivered in the Pittsburgh district.

Plates.—The minimum nominal price on plates is 2c., Pittsburgh, for delivery at convenience of the mill, but there is no trouble in getting 2.25c. to 2.50c. at mill for ¼-in. and heavier for shipment in three to four weeks. The Pennsylvania Railroad will build at its Altoona shops 105 locomotives, 1000 steel box cars and 75 special cars for hauling automobiles. A good part of the plates and shapes required will come to Pittsburgh, and some to Eastern mills. Plates are probably the scarcest item in the whole list, and the enormous demand for marine plates has forced the price up steadily. Several large makers have sold their product for at least six months, and have taken a good deal of business for third quarter. We now quote ¼-in. and heavier plates nominally at 2c. for shipment at convenience of the mill, and 2.25c. to 2.50c., or higher, for delivery in three to four weeks.

Structural Material.—Local fabricators are filled for five to six months, and are not bidding actively on new work. The American Bridge Company has taken 1000 tons for a car float for the Morgan, Louisiana & Texas Railroad & Steamship Company at New Orleans. The nominal price of shapes is 1.90c., but 2c. and up to 2.25c. is paid for prompt deliveries.

Steel Rails.—Effective Friday, Jan. 21, prices on light rails were advanced $3 per ton, due to the heavy demand and the higher prices for steel. Last week the Carnegie Steel Company took new orders and received specifications for close to 5000 tons. This company will also roll 6000 tons of standard sections for the Pittsburgh & Lake Erie, 4000 tons for India and 2000 tons for Portuguese East Africa, the latter two orders having been taken by the United States Steel Products Company. Other heavy foreign shipments of standard sections are being made by the Carnegie Company. The new prices on light rails, effective from Jan. 21, are as follows: 25 to 45 lb. sections, 1.70c.; 16 and 20 lb., 1.75c.; 12 and 14 lb., 1.80c.; 8 and 10 lb., 1.85c., in carload lots. An advance of 5c. per 100 lb. is charged for less than carloads and down to three tons, while under three tons, an additional 5c. is charged. There

has also been an advance in prices of joints for light rails. We quote standard section rails of Bessemer stock at 1.25c. and of open-hearth steel, 1.34c., Pittsburgh.

Sheets.—Most mills have their output well sold up for first half, particularly on blue annealed and electrical sheets. Customers are anxious to place orders for second half, but the mills so far are refusing to book such business. The demand for blue annealed and electrical sheets is the heaviest ever known, and mills are sold up for first half. The American Sheet & Tin Plate Company is now holding Nos. 9 and 10 blue annealed sheets at 2.65c. minimum. For delivery in first and second quarters we quote: Nos. 9 and 10 blue annealed sheets at 2.65c. to 2.75c.; No. 28 Bessemer black, 2.60c.; No. 28 galvanized, 4.75c. to 5c. We quote Nos. 22 and 24 black plate, tin mill sizes, H. R. and A., at 2.30c. to 2.40c.; Nos. 25, 26 and 27, 2.35c.; No. 28, 2.40c.; No. 29, 2.45c., and No. 30, 2.50c. These prices are for carload and larger lots, f.o.b. maker's mill.

Tin Plate.—New demand is heavy, and mills report specifications coming in freely. It is said some independent mills are now quoting $4 per base box, and it is believed this price will be general shortly. Export demand is active, but some mills cannot quote on this business, as their entire output is sold up for months. All the tin-plate mills are running to practically 100 per cent of capacity and expect to continue to do so indefinitely. Occasionally there is trouble in getting steel, and this restricts output to some extent. On a recent sale of about 80,000 boxes of bright plate for export, higher than $3.75 base was obtained. We quote 14 x 20 coke plates at $3.75 to $3.90 per base box, and 200-lb. base, common ternes, 8-lb. coating, at $6.90 to $7 per box.

Railroad Spikes.—New demand is fairly heavy, but specifications from the railroads are not coming in very freely. Some jobbers who have fairly large stocks of spikes have recently sold as low as $2.15, which is 10c. under the mill price, but it is stated this price has not been met by any of the makers. We quote:

Standard railroad spikes, 4½ x 9/16 in. and larger, $2.25; railroad spikes, ½ and 7/16 in., $2.35 base; railroad spikes, ⅜ in. and 5/16 in., $2.50 base; boat spikes, $2.35 base, all per 100 lb., f.o.b. Pittsburgh.

Skelp.—Mills report new demand more active than for some months and prices are about $2 per ton higher. Most makers have their output sold for three or four months. We quote: Grooved steel skelp, 1.90c. to 1.95c.; sheared steel skelp, 2c. to 2.05c.; grooved iron skelp, 2.30c. to 2.35c., and sheared iron skelp, 2.40c. to 2.45c., all delivered to consumers' mills in the Pittsburgh district.

Wire Rods.—Any prices quoted on wire rods are purely nominal, as local makers have their output sold up, and have not been selling in the open market for months. One mill reports it recently sold upward of 4000 tons of high carbon open-hearth rods for export, for which it obtained about $55, f.o.b. Pittsburgh. Another export sale of about 1500 tons of Bessemer rods is reported at $50 or higher, Pittsburgh. We quote Bessemer, open-hearth and chain rods at nominally $45 to $48, prices depending on delivery wanted.

Wire Products.—Effective Monday, Jan. 24, prices on wire and wire nails were advanced $2 per ton, discounts on woven wire fencing were lowered three points, or an advance of about $6 per ton, and cement coated nails were advanced 15c. per keg. This advance, which was generally expected by the trade, is due to the abnormally heavy demand and the fact that the mills have their output of wire and wire nails sold up for four or five months. Several mills are urging jobbers to discontinue the practice of placing orders for mill shipment to customers, and to take in the nails and wire themselves, so as to have as large stocks as possible under present conditions. It is said that premiums of $5 to $10 per ton have recently been paid over domestic prices on barb wire for export. Prices quoted to the large trade, and for shipment at convenience of the mill only, are as follows: Wire nails, $2.20; galvanized, 1-in. and longer, taking an advance over this price of $2, and shorter than 1-in., $2.50; plain annealed wire, $2.05; galvanized barb wire and fence staples, $3.05; painted barb wire, $2.35; polished fence staples, $2.35; cement coated nails, $2 base, all f.o.b. Pittsburgh, with freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven wire fencing are three points lower and are now quoted at 64½ per cent off list for carload lots; 63½ per cent for 1000-rod lots and 62½ per cent for small lots, f.o.b. Pittsburgh.

Hoops and Bands.—Makers report new demand heavy, and specifications against contracts very active. All the mills are back in deliveries 10 to 12 weeks or longer. We quote steel hoops at 2c. to 2.10c., and steel bands, 1.90c. to 2c., with extras on the latter as per the steel bar card. These prices are for delivery at convenience of the mill, premiums being paid for shipment within three or four weeks from date of order.

Shafting.—Discounts are purely nominal, as makers say they have no shafting to sell in the open market before July 1, and are unable to take care of the heavy demand for regular customers. Automobile builders, implement makers and the screw stock trade are specifying heavily against contracts. Premiums are being paid for prompt shipment when a mill can be found to make delivery. We quote cold-rolled shafting at 45 per cent off in carloads and 40 per cent in less than carloads, f.o.b. Pittsburgh.

Iron and Steel Bars.—The minimum price on steel bars is 1.90c., Pittsburgh, for delivery at convenience of the mill, while for shipment in three or four weeks from date of order, 2c. and 2.25c. are being quoted. Large export inquiries are in the market for steel rounds for shrapnel, but very little of this business is placed with local mills, as they are filled so far ahead they cannot make deliveries. Makers report the new demand for iron bars as very active, and for the first time in several years the iron-bar mills in the Pittsburgh district are running to capacity. We quote steel bars at 1.90c. to 2c. for delivery at convenience of the mill; 2.10c. to 2.25c. for shipment in three or four weeks, and 2.35c. to 2.50c. for delivery from warehouse. Prices are higher on refined iron bars, which we quote at 2c. to 2.05c., and railroad test bars, 2.10c. to 2.15c., f.o.b. mill, Pittsburgh.

Nuts and Bolts.—Prices are very strong and an advance of about 10 per cent is looked for this week. Both export and domestic demand are very heavy. Makers of nuts and bolts are sold up for four or five months, and are much behind in deliveries. Discounts in effect at this writing for shipment at convenience of the maker are as follows:

Carriage bolts, small, rolled thread, 70 & 12½ per cent off; small, cut thread, 70 & 5; large, 65. Machine bolts with h. p. nuts, small, rolled thread, 70 & 10 & 7½; small, cut thread, 70 & 12½; large, 65 & 10. Machine bolts with c. p. c. & t. nuts, small, 70; large, 60 & 10. Bolt ends, with h. p. nuts, 65 & 10; with c. p. nuts, 60 & 10. Lag screws (cone or gimlet point), 75. Rough stud bolts, 60. Forged set screws and tap bolts, 40. Hot pressed square nuts, tapped or blank, $4.50 off list; hexagon, $4.70 off. C. p. c. & t. square nuts, tapped or blank, $4.00 off; hexagon, $5.25 off. C. p. plain square nuts, tapped or blank, $4.00 off; hexagon, $4.20 off. Semi-finished hexagon nuts, 80 per cent off. Finished and case-hardened nuts, 75 & 10. Rivets, 7/16 in. diameter and smaller, 70 & 10. These prices are delivered in lots of 300 lb. or more where the actual freight rate does not exceed 20c. per 100 lb.

Merchant Steel.—The new demand is very active and mills are back in deliveries six to eight weeks or longer. Prices are strong and are certain to be higher in the near future. On small lots we quote: Iron finished tire, ½ x 1½ in. and larger, 2.05c., base; under ½ x 1½ in., 2.20c., planished tire, 2.25c.; channel tire, ¾ to ⅞ and 1 in., 2.55c. to 2.65c.; 1 x ⅛ in. and larger, 2.95c.; toe calk, 2.65c. to 2.75c., base; flat sleigh shoe, 2.40c.; concave and convex, 2.45c.; cutter shoe, tapered or bent, 2.95c. to 3.05c.; spring steel, 2.65c. to 2.75c.; machinery steel, smooth finish, 2.45c.

Carwheels.—The 5000 cars placed last week by the Pennsylvania Railroad are to be equipped with forged steel wheels. Probably two-thirds of the 40,000 wheels will be placed with the two local makers. The steel carwheel makers are back in deliveries 8 to 10 weeks. Prices are very strong. We quote 33-in. freight carwheels in lots of 1000 or more at $18; 33-in. tender

wheels, $21; 36-in. passenger or tender wheels, $25. These prices are based on a 10-in. diameter hub, 50c. extra being charged for 11-in., all f.o.b. Pittsburgh.

Rivets.—Export shipments of rivets have again been resumed, one local maker starting two carloads last week. Domestic demand is heavy, and with another advance in steel bars higher prices on rivets are expected. We quote button-head structural rivets, ½ in. and larger, at $2.60, and, cone-head boiler rivets at $2.70 per 100 lb., in carload lots, f.o.b., Pittsburgh, smaller lots bringing about 10c. advance.

Cold-Rolled Strip Steel.—Prices are very strong. For delivery at convenience of the mill, which would mean in three to four months, we quote cold-rolled strip steel, 1½ in. and wider, under 0.20 carbon, sheared or natural mill edge, per 100 lb., at $4, but up to $4.50 has been paid for reasonably prompt shipment. Standard extras, named by all the makers, are as follows:

0.10 to 0.19 Carbon—1½ In. and Wider

Coils			Lengths 24 In. and Over	
Hard	Soft		Hard	Soft
Base	$0.25	100 and heavier	$0.10	$0.35
$0.05	0.30	0.050 to 0.099	0.20	0.45
0.20	0.45	0.035 to 0.049	0.35	0.60
0.35	0.75	0.031 to 0.034	0.60	1.00
0.45	0.85	0.025 to 0.030	0.85	1.25
0.55	0.95	0.020 to 0.024	1.05	1.45
1.35	1.35	0.017 to 0.019	2.45	2.45
1.75	1.75	0.015 to 0.016	2.85	2.85
2.45	2.45	0.013 to 0.014	3.70	3.70
2.80	2.80	0.012	4.30	4.30
3.15	3.15	0.011	4.65	4.65
3.50	3.50	0.010	5.00	5.00

Extras for soft apply for all intermediate tempers.

Wrought Pipe.—Effective Thursday, Jan. 20, prices on black and galvanized steel and iron wrought pipe were advanced $2 per ton on some sizes, $4 on others and $6 on a few. Discount cards on black and galvanized wrought-iron pipe are now uniform, all makers quoting the same prices. The demand for iron and steel pipe is heavy, and mills are working very closely to capacity. The new discounts will be found on another page of this issue.

Boiler Tubes.—Effective Jan. 20, discounts on iron and steel boiler tubes were lowered two points, equal to an advance of $4 per ton. The demand is reported abnormally heavy, the mills being filled for three or four months or longer. On seamless tubes, makers state they have all the orders on their books they can get out up to July 1 or longer. The new discounts will be found on another page.

Old Material.—The local market is quiet and prices are only fairly strong. Consumers bought heavily a short time back, and the open weather is allowing scrap to be delivered promptly. For the time being they are out of the market as buyers. There are no embargoes on scrap at present, and the two Youngstown interests involved in the recent labor troubles are now taking in old material freely. Sales of the past week were mostly of small lots. The new demand for low phosphorus melting stock has quieted down, and prices are slightly easier. Dealers quote for delivery in the Pittsburgh and nearby districts that take the same rates of freight as follows, per gross ton:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$17.50 to $18.00
Compressed side and end sheet scrap	16.25 to 16.50
No. 1 foundry cast	15.75 to 16.00
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	14.50 to 15.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	18.00 to 18.25
No. 1 railroad malleable stock	15.50
Railroad grate bars	10.75 to 11.00
Low phosphorus melting stock	20.00 to 20.50
Iron car axles	24.50 to 25.00
Steel car axles	26.00 to 26.50
Locomotive axles, steel	24.00 to 24.50
No. 1 busheling scrap	15.00
Machine shop turnings	9.75 to 10.00
Old carwheels	14.50
Cast-iron borings	10.75 to 11.00
*Sheet bar crop ends	18.00 to 18.50
Old iron rails	16.00 to 16.50
No. 1 railroad wrought scrap	18.50 to 19.00
Heavy steel axle turnings	13.50 to 14.00
Heavy breakable cast scrap	13.50 to 14.00

*Shipping point.

Coke.—Last week, with a serious shortage in car supply, some blast furnaces were running short of coke, and rather than shut down they paid $4 to $4.50, and, it is reported, as high as $4.75 for spot coke. This week the car situation is much better, and prices have receded to about $3 to $3.25 for prompt furnace coke, with very little demand. We quote best grades of blast furnace coke for spot shipment at $3 to $3.25, and on contracts from $2.50 to $2.75. We quote best grades of 72-hr. foundry coke for prompt shipment at $3.50 to $3.75, and on contracts $3.25 to $3.50 per net ton at oven. The Connellsville *Courier* gives the output of coke for the week ended Jan. 15 in the upper and lower Connellsville regions as 420,521 net tons, a decrease on the previous week of 9477 tons.

Chicago

CHICAGO, ILL., Jan. 26, 1916.—(*By Wire.*)

The market is still moving in the direction of higher prices and a greater scarcity of finished steel products. To the shortage of rolled steel is now added a shortage of labor, which, in some localities, is decidedly acute. It is not difficult to see that conditions in their present trend have in them the possibility of markedly curtailing the profits of manufacturing operations. Price advances in the past week have been numerous. Iron and hard steel bars are now 1.90c., Chicago mill. Jobbers have raised their quotations $2 per ton for plates, bars and blue-annealed sheets. While there are some evidences that the high cost of raw materials is holding back possible business, the increasing indefiniteness of delivery promises is an even greater deterrent. The new business which arises from a general covering of requirements has, as a result, decreased, yet most of the mills continue to receive new orders, in tonnage closely approaching shipments, while specifications are steadily in excess of output. Instead of the usual opening of books, the mills will doubtless do what is possible in covering customers' needs for the second half by a proportioning of the small remaining available production. The old material market presents an interesting contrast, in the plethora of scrap available and the downward tendency of prices, and there are those who see in this weakness a counterpart of the situation that existed in 1913, when the maximum output of new materials was paralleled by a continually larger outpouring of scrap.

Pig Iron.—Except for a possible half dozen transactions completed and under negotiation, in which an aggregate of 5000 tons of Southern and Northern iron is involved, interest in the market is generally lacking, particularly with respect to last half deliveries. Sales that have been reported indicate a firm maintenance of previously quoted prices, $15.50 having been done for second quarter Southern iron and $18.50 for local foundry. Iron is going forward freely against contracts, and the melt gives substantial evidence of having markedly increased. The wide spread in the price of charcoal iron is an interesting feature of the market, one large interest holding at $19, while recent sales have been made of Nos. 2 to 5 grades at prices as low as $17.50 at furnace. Ohio silveries are now on the basis of $25 at furnace for 8 per cent, while there is Southern iron offering of 5 per cent silicon analysis at a price of $22.75, delivered Chicago. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$19.75
Lake Superior charcoal, No. 1	20.25
Lake Superior charcoal, No. 6 and Scotch	20.75
Northern coke foundry, No. 1	19.00
Northern coke foundry, No. 2	18.50
Northern coke foundry, No. 3	18.00
Southern coke, No. 1 f'dry and 1 soft	19.50 to 20.00
Southern coke, No. 2 f'dry and 2 soft	19.00 to 19.50
Malleable Bessemer	19.00
Basic	18.00
Low phosphorus	32.00 to 36.00
Silvery, 8 per cent	27.50
Silvery, 10 per cent	28.50

(*By Mail*)

Rails and Track Supplies.—Inquiry for 50,000 tons of rails in this market, reported a week ago, developed

into sales of even larger tonnage. To its principal purchase of 30,000 tons, to be rolled at Chicago for forward delivery, the Chicago, Milwaukee & St. Paul added 8500 tons for prompt shipment by all rail, distributed 3000 tons each to the Cambria and Lackawanna Steel companies and 2500 tons to the Bethlehem Steel Company. Other smaller lots included 7000 tons for the Minneapolis & St. Louis and 4000 tons each for the St. Joseph & Grand Island and the Cincinnati, Hamilton & Dayton. The inquiries of the Kansas City Southern and a number of other railroads for small amounts, ranging from 500 to 1500 tons, remain to be closed. Business in light rails continues to increase in volume, and local prices, following the upward movement of the Eastern market, have been advanced $1.80 per ton. The minimum price for spikes is now 2.25c. While the price of steel tie-plates is still at $36, this figure is largely nominal in view of the mill situation, the makers of iron plates selling at $38 and even as high as $40. Recent orders include 1200 tons from the Central of Georgia, 850 tons from the Mobile & Ohio and small lots from other roads, to which interest attaches particularly because of their distance from this market. We quote standard railroad spikes at 2.25c., base; track bolts with square nuts, 2.50c., base, all in carload lots, Chicago; tie plates, $36 to $38, f.o.b. mill, net ton; standard section, Bessemer rails, Chicago, 1.25c., base, open hearth, 1.34c.; light rails, 25 to 45 lb., 1.52c.; 16 to 20 lb., 1.57c.; 12 lb., 1.62c.; 8 lb., 1.67c.; angle bars, 1.50c., Chicago.

Structural Material.—To the car inquiry reported a week ago have been added 1000 gondolas and miscellaneous passenger equipment for the Illinois Central, and 1000 box cars for the Southern. It is understood that the Union Pacific has withdrawn its inquiry, as much because of the uncertain deliveries promised as of the very high prices named. The number of small lots of cars on which prices are being taken also runs into a large total. The structural situation is interesting in that the fabricating work under consideration is largely limited to small jobs for which the greater part of the necessary material can be worked up out of fabricators' stocks. Few jobs are being figured on the basis of mill shipments and, correspondingly, the prices secured are almost entirely on the basis of material out of stock and are exceptionally profitable. Among eight contracts reported last week, all of which, with a single exception, were for 250 tons or less, the largest was for 1200 tons for a public service station near Joliet, Ill., the steel to be furnished by the Kenwood Bridge Company. The total reported is less than 2500 tons. The price of plain material from mill has been advanced to a minimum basis of 1.90c., Pittsburgh, and while this price is practically nominal because of the almost indefinite delivery to which it is applicable, there is also but little paying of premiums. We quote for Chicago delivery of structural steel from mill 2.089c.

For structural steel out of stock we continue to quote for Chicago delivery 2.50c.

Plates.—The scarcity of plates is accentuated with each succeeding week. The restoration of the former differential of $2 per ton over structural material is an evidence of a condition which has not existed for several years. Purchases of plates for first quarter are noted at prices ranging from 2.25c. to 2.50c., while prompt shipment quotations closely approach 3c., Pittsburgh. We quote for Chicago delivery of plates from mill 2.189c.

The position of particular demand and particular scarcity into which plates have come is indicated by an advance in the price out of stock which places them at a premium of $2 per ton over structural material. We accordingly revise our quotation and quote for Chicago delivery out of store 2.60c.

Sheets.—The demand for heavy sheets, particularly in the gages closely approaching plates, has distorted the usual relationship existing between the blue-annealed and box-annealed basis and, as a result, for certain gages a confusion of prices obtains, depending on the basis from which the quotation is derived. No. 28 black sheets are quoted at approximately the same range of prices as No. 10 blue annealed. We quote for Chicago delivery from mill, No. 10 blue annealed, 2.939c.; No. 28 black, 2.839c. to 2.889c.; No. 28 galvanized, 4.689c. to 5c.

An advance of $2 per ton for blue annealed sheets out of stock has been made. We quote for Chicago delivery from jobbers' stock as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 2.80c.; No. 28 black, 3c.; No. 20 and heavier galvanized, 4.80c.; No. 22 and lighter, 5c.

Bars.—Foreign inquiry for bars is being brought to the point of closing rather slowly. Some business has been placed but other larger contracts appear to be dependent on a settling of the sizes in which the bars are to be rolled. Standard bars present few features of market interest other than the advance to the basis of 1.90c., Pittsburgh. Bar-iron prices have reached the basis of 1.90c., at Chicago mill, and hard steel quotations range from the same price to 2c. We quote mill shipments, Chicago, as follows: Bar iron, 1.90c.; soft steel bars, 2.189c.; hard steel bars, 1.90c. to 2c.; shafting, in carloads, 45 per cent off; less than carloads, 40 per cent off.

We quote store prices for Chicago delivery: Soft steel bars, 2.50c.; bar iron, 2.50c.; reinforcing bars, 2.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 30 per cent off.

Old Material.—The weakness in the market continues, and until some let-up appears in the outpouring of scrap, little improvement in the situation can be expected. Congestion at the works of all of the principal melters is the general condition and the attendant evils of car service and rejections are correspondingly pronounced. Except in lots of a few carloads, the buying of scrap is, for the time being, of little importance. Railroad scrap now being offered includes 5000 tons from the Rock Island, 3200 tons of rerolling rails from the Great Northern, 2400 tons from the Burlington, 1500 tons from the Wabash and 600 tons from the Chicago & Alton. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$17.50 to $18.00
Relaying rails	19.50 to 20.50
Old carwheels	14.25 to 14.50
Old steel rails, rerolling	17.25 to 17.50
Old steel rails, less than 3 ft	16.50 to 16.75
Heavy melting steel scrap	15.25 to 15.75
Frogs, switches and guards, cut apart	15.25 to 15.75
Shoveling steel	14.75 to 15.25
Steel axle turnings	11.75 to 12.25

Per Net Ton

Iron angles and splice bars	$17.00 to $17.25
Iron arch bars and transoms	18.00 to 18.50
Steel angle bars	14.00 to 14.50
Iron car axles	19.50 to 20.00
Steel car axles	21.50 to 22.00
No. 1 railroad wrought	15.75 to 16.00
No. 2 railroad wrought	14.00 to 14.50
Cut forge	14.00 to 14.50
No. 1 busheling	12.75 to 13.00
No. 2 busheling	9.00 to 9.25
Pipes and flues	11.50 to 12.00
Steel knuckles and couplers	14.75 to 15.25
Steel springs	15.75 to 16.25
No. 1 boilers, cut to sheets and rings	11.00 to 11.50
Boiler punchings	13.75 to 14.25
Locomotive tires, smooth	17.00 to 17.50
Machine shop turnings	8.50 to 8.75
Cast borings	7.75 to 8.00
No. 1 cast scrap	13.00 to 13.50
Stove plate and light cast scrap	11.00 to 11.25
Grate bars	11.00 to 11.25
Brake shoes	10.25 to 10.75
Railroad malleable	13.75 to 14.00
Agricultural malleable	11.50 to 12.00

Cast-Iron Pipe.—For the 800 tons of pipe to be bought at Saginaw, Mich., the American Car & Foundry Company's Detroit shop is the low bidder, while for 2500 tons at St. Paul the low quotation is that of the leading interest. The only new letting of importance reported covers 700 tons at Sioux City, Iowa. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $32.50 to $33; 6 in. and larger, $29.50 to $30, with $1 extra for class A water pipe and gas pipe.

Rivets and Bolts.—While the manufacturers using bolts and screws and the jobbers of these products have been specifying liberally against their contracts, the distribution to the retail trade and smaller consumers has not been so rapid. Merchandizing stocks are accordingly large. The demand for rivets is one of the few remaining directions in which only moderate activity prevails. We quote as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 70; cut thread, 65-10;

larger sizes, 60-5; machine bolts up to ⅞ x 4 in., rolled thread, with hot pressed square nuts, 70-5; cut thread, 70; larger sizes, 60-10; gimlet point coach screws, 70-10; hot pressed nuts, square, $4 off per 100 lb.; hexagon, $4.20 off. Structural rivets, ¾ to 1¼ in., 2.60c. to 2.65c., base, Chicago, in carload lots, boiler rivets, 10c. additional.

We quote revised prices, out of store: Structural rivets, 2.75c.; boiler rivets, 2.85c.; machine bolts up to ⅞ x 4 in., 70-12½; larger sizes, 65-10; carriage bolts up to ¾ x 6 in., 70-5; larger sizes, 65 off; hot pressed nuts, square, $4.50, and hexagon, $4.70 off per 100 lb.; lag screws, 75.

Wire Products.—A further advance of $2 per ton for wire products has been announced. This places nails on the basis of 2.20c., Pittsburgh. Conditions in the trade are unchanged, the shortage of material to meet domestic requirements being the outstanding factor. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, $2.239; wire nails, $2.389; painted barb wire, $2.539; galvanized barb wire, $3.239; polished staples, $2.539; galvanized staples, $3.239, all Chicago.

Philadelphia

PHILADELPHIA, PA., Jan. 25, 1916.

The situation in plates is particularly serious. Their scarcity is indicated by the predicament of a leading maker who is filled up to August and has withdrawn prices, yet is deluged with requests for tonnage which intimate that price is no object. Steel bars are practically as difficult to obtain, and the pressure at mills rolling structural shapes continues great. Sellers of English ferromanganese have withdrawn from the market, so far as the first half of the year is concerned, and those handling the domestic product are sold up. Pig iron has been somewhat quieter, but quotations continue strong, and the makers and their agents are most optimistic. The heavy production of machine-shop turnings by shell makers and others and their accumulation through inability to move them, have made them the weak feature of the old material market. Rolling-mill scrap, for which there was a great demand a few weeks ago, is easier also because of the quantities then purchased. Premium prices are asked for spot furnace coke.

Pig Iron.—The market is quieter than it was a few weeks ago, but a fair business in miscellaneous lots of small or moderate size is being done, mostly for the second quarter. For eastern Pennsylvania No. 2 X the general quotation is unchanged at $20, furnace. The delivered price is close to $20.75, a figure which could be shaded where a large quantity was involved. A Virginia producer which has been quoting $17.25 to $18, furnace, according to delivery, for No. 2 X, announces that its price is now $18, furnace, or $20.75, Philadelphia, for delivery in any part of 1916. It quotes No. 2 plain at $17.50, furnace, any delivery this year, and gray forge $17, likewise. The reason for this leveling of prices is understood to be that the company in question has but little iron to offer for the first six months of the year. For eastern Pennsylvania gray forge $19.75 has been quoted to consumers the past week. Basic has been inactive, but some feelers are out, and the leading Eastern buyer is expected to take action at an early day. The users of standard low phosphorus are well covered for first quarter requirements. The minimum quotation continues at about $32, delivered, though for some spot low phosphorus $36.50 and over, delivered, has been asked. Representatives of the local trade received notice this morning that the New York, New Haven & Hartford Railroad had raised its embargo against iron shipments, thereby relieving a situation which has been especially embarrassing for Virginia furnaces. Quotations for standard brands, delivered in buyers' yards, prompt shipment, range about as follows:

Eastern Pa., No. 2 X foundry	$20.00 to $20.75
Eastern Pa., No. 2 plain	19.75 to 20.50
Virginia, No. 2 X foundry	20.00 to 20.75
Virginia, No. 2 plain	19.50 to 20.25
Gray forge	19.00 to 19.75
Basic	19.50 to 20.00
Standard low phosphorus	32.00

Iron Ore.—The only arrival of foreign ore reported at this port in the week ended Jan. 22 consisted of 7750 tons from Cuba.

Ferroalloys.—Most sellers of English 80 per cent ferromanganese have withdrawn all offerings for the first half. For far off deliveries their quotation is unchanged at $125, seaboard. The leading seller of the domestic product, an importer of Brazilian ore who has turned a part of his importations into ferromanganese through conversion arrangements, has temporarily withdrawn from the market because of his sold-up condition. An arrival from England last week at this port consisted of 493 tons.

Bars.—The nominal quotation for steel bars is 1.90c., Pittsburgh, or 2.059c., Philadelphia, but prompt deliveries are not to be had at these figures. The difficulty of placing orders is greater than ever. The nominal quotation for iron bars is 2.10c., Pittsburgh, or 2.259c., Philadelphia, carload lots, but premiums are asked in connection with this quotation.

Plates.—Actual prices for plates are most difficult to gage. A large company cannot give deliveries on new business this side of August, and has withdrawn its quotation of 2.50c., Pittsburgh, which was made to some regular customers. It is giving careful consideration to every inquiry, and is disinclined to take any orders under 3c., Eastern mill. Another maker quoted 2.75c., Pittsburgh, or 2.909c., Philadelphia. The mills are besieged with requests for tonnage, and price seems no object. The answer is that the mills are oversold.

Structural Material.—Where mills in eastern Pennsylvania can take care of their best customers they quote 2.159c., Philadelphia. To others they quote 2.25c., Pittsburgh, or Eastern mill. The demand from both East and West continues to hold up. One inquiry now under consideration calls for 15,000 tons of plain material for delivery through eight months, the intending buyer being a dealer.

Billets.—Producers are out of the market for the first half, yet the pressure on them does not diminish. On forward deliveries one maker quotes $40 to $45 for open-hearth rerolling billets and $55 to $60 for forging billets.

Sheets.—The demand is more overwhelming than ever, and the quotation for No. 10 blue annealed sheets has been advanced. Makers ask 2.905c. to 3.159c., Philadelphia. Large jobbers are running short of stocks and find it difficult to make deliveries.

Coke.—Conditions in the coke fields, coupled with the shortage of freight cars, have upset the market and caused premiums to be offered for prompt shipment. Holidays and cold weather have hampered production. For spot furnace coke $4.50 to $5 per net ton at oven is quoted. Prompt foundry continues around $4. First half furnace ranges from $2.50 to $3, and contract foundry from $3 to $3.50.

Old Material.—In the past few days machine shop turnings have become a drug on the market, and quotations have declined. Not only has the production of this grade of scrap been great, but it has accumulated because of the freight congestion. Rolling-mill scrap is a little weaker also, because of the large commitments of the mills, but heavy melting steel continues strong, as it did not advance in proportion with rolling-mill stock. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania, and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$16.50 to $17.00
Old steel rails, rerolling	19.00 to 20.00
Low phos. heavy melting steel scrap	21.50 to 22.50
Old steel axles	25.00 to 26.00
Old iron axles	27.00 to 28.00
Old iron rails	19.50 to 20.00
Old carwheels	16.50 to 17.00
No. 1 railroad wrought	22.00 to 22.50
Wrought-iron pipe	16.00 to 16.50
No. 1 forge fire	13.50 to 14.00
Bundled sheets	13.50 to 14.00
No. 2 busheling	11.00 to 11.50
Machine shop turnings	10.00 to 11.00
Cast borings	11.50 to 12.00
No. 1 cast	17.00 to 18.00
Grate bars, railroad	12.50 to 13.00
Stove plate	13.00 to 13.50
Railroad malleable	15.00 to 15.50

Cincinnati

CINCINNATI, OHIO, Jan. 26, 1916.—(*By Wire.*)

Pig Iron.—Malleable iron is more active. Two sales are reported in this territory, totaling 3000 tons, for last half. Northern foundry iron also shows signs of improvement, and for the same shipment 1000 tons was booked for an Indiana melter. A consumer of Virginia iron not in this immediate territory bought through a local agency 800 tons for last half. The inquiry for foundry iron is limited to comparatively small lots, with the exception of one from central Ohio for 1000 tons of No. 2 foundry and another from northern Ohio for 500 tons. Buyers are not yet taking any large interest in the market, as most of them are covered for their first half requirements, and those who have not contracted for the last half are slow in making contracts for that delivery. A minimum quantity of iron is under personal negotiation by pig-iron salesmen, consequently sales are correspondingly light. Northern foundry, malleable and basic irons are firm at $18, Ironton, and Southern iron is quotable at $14.50 to $15.50 for first half shipment and $15 to $16, Birmingham basis, for the last half. Ohio silvery irons are held at $25, furnace, on an 8 per cent analysis and several small sales were recently made on this basis. Virginia No. 2 X has been advanced 50c. in this market, making the present minimum quotation $18 at furnace. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$17.90 to $18.40
Southern coke, No. 2 f'dry and 2 soft.	17.40 to 17.90
Southern coke, No. 3 foundry	16.90 to 17.40
Southern No. 4 foundry	16.40 to 16.90
Southern gray forge	15.90 to 16.40
Ohio silvery, 8 per cent silicon	26.26 to 26.76
Southern Ohio coke, No. 1	20.76 to 21.26
Southern Ohio coke, No. 2	19.76 to 20.26
Southern Ohio coke, No. 3	19.26 to 19.76
Southern Ohio malleable Bessemer	19.26 to 19.76
Basic, Northern	19.26 to 19.76
Lake Superior charcoal	21.20 to 22.20
Standard Southern carwheel	24.40 to 24.90

(*By Mail*)

Finished Material.—The situation is unchanged although the warehouse price on galvanized sheets is stronger. The quantity of No. 28 galvanized sheets available below 5c. is negligible. No. 10 blue annealed sheets are strong at 2.70c. There is a better demand for steel bars, the price remaining at 2.45c. Structural shapes are quoted at 2.55c., cut to lengths when desired. The nearby mills are holding No. 28 galvanized sheets at 5.15c., Cincinnati, or Newport, Ky., and No. 28 black sheets at 2.65c. to 2.70c. The local jobbers' quotations on wire nails to-day is 2.20c. per keg base, although one has advanced to 2.30c.

Old Material.—All prices are rather soft, but no changes can be made this week. Not much new business is being transacted, but no hold-ups are reported on the part of shippers on old contracts. The minimum prices given below represent what dealers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices, f.o.b. at yards.

Per Gross Ton

Bundled sheet scrap	$10.75 to $11.25
Old iron rails	15.50 to 16.00
Relaying rails, 50 lb. and up	21.00 to 21.50
Rerolling steel rails	14.25 to 15.25
Heavy melting steel scrap	14.25 to 14.75
Steel rails for melting	14.00 to 15.00

Per Net Ton

No. 1 railroad wrought	$13.50 to $14.00
Cast borings	7.50 to 8.00
Steel turnings	7.25 to 7.75
Railroad cast scrap	11.75 to 12.00
No. 1 machinery scrap	13.50 to 14.00
Burnt scrap	8.75 to 9.25
Iron axles	19.25 to 19.75
Locomotive tires (smooth inside)	13.25 to 13.75
Pipes and flues	10.25 to 10.75
Malleable and steel scrap	10.75 to 11.25
Railroad tank and sheet scrap	8.75 to 9.25

Coke.—Fancy prices have been secured for spot shipment of Connellsville furnace and foundry coke; that is, when the oven operators were able to fill orders. Contract figures on 48-hr. Connellsville coke are unchanged from $2.30 to $2.65 per net ton at oven, but prompt has sold as high as $4.25 and there are no stable quotations on which to base a spot market price. Connellsville foundry coke for prompt shipment has sold at the same price as prompt furnace coke, while contract quotations range from $3 to $3.60. We quote Wise County and Pocahontas 48-hr. coke from $2.75 to $3 and foundry coke, $3.25 to $3.75. The producers have not suffered as much from car shortage as those in other districts.

Buffalo

BUFFALO, N. Y., Jan. 25, 1916.

Pig Iron.—Good demand for last half delivery has been in evidence with indications of a stronger buying movement. Current consumption is increasing and prompt shipment business is filling up untaken furnace capacity. Shipments are very heavy, and the gradual lifting of embargoes on consignments into New England territory is tending to make the entire situation more regular and healthful. Prices remain practically unchanged and are as follows, f.o.b. furnace, Buffalo, for current and last half delivery:

No. 1 foundry	$18.50 to $19.00
No. 2 X foundry	18.00 to 19.00
No. 2 plain	18.00 to 19.00
No. 3 foundry	17.50 to 19.00
Gray forge	17.50 to 19.00
Malleable	19.00 to 20.00
Basic	20.00
Charcoal, regular brands and analysis	21.00 to 22.00

Finished Iron and Steel.—Mills are still declining to open books for contracts to be specified against in the third and fourth quarters, and very few have open capacity to accommodate current and second quarter demand. Sellers are reserved as to future commitments because of the present sold-up conditions, which in some instances are more troublesome than ever, the cold weather of last week interfering with production. One or two agencies are entirely out of the market, while others are accepting limited specifications for rollings at mills' convenience, which will mean delivery in the third quarter. The leading interest has advanced the price for steel bars and shapes to 1.90c. for prompt specification for shipment at mills' convenience, which is practically third quarter, and does not cover open contracts to be specified any time prior to or in the third quarter. The absolute minimum for plates is now 2c., Pittsburgh base, and for hoops 2.10c., with the same conditions applying to bars and shapes. In cold-rolled steel ability to secure material at a definite date, and not price, is the deciding factor. At least two of the leading producers have advanced the price to 42 per cent off, carload lots, for specifications to be filed in the second quarter, and one producer is entirely sold up and has nothing to offer in this commodity. Wire nails and all wire products have advanced $2 per ton. Deliveries on tin plate are very much behind, and are becoming so much extended that it is a very serious question whether manufacturers of tin cans will be able to obtain their supplies in sufficient time to meet the demands of the canners. Warehouse prices have been advanced by the leading interest to 2.60c., f.o.b. Buffalo, for bars and small shapes (except for rounds and squares 2 in. and over, which have been advanced to 3.30c., f.o.b. Buffalo), plates to 2.90c. and hoops to 3.20c. Bids are in for 1200 tons for the Ten Eyck Hotel, Albany, as well as for steel for the Dental Dispensary building, Rochester, 100 tons. Bids will soon be asked for the Niagara Square Hotel, this city, about 200 tons. The Pittsburgh Bridge & Iron Company has taken 200 tons for the Union Carbide Company's plant at Sault Ste. Marie, Mich., and the McClintic-Marshall Company 100 tons for the same plant. The Seneca Engineering Company, Montour Falls, has 200 tons for an eight-story professional building at Rochester, and the Genesee Bridge Company 100 tons for a foundry and machine shop for the Gleason Works in the same city.

Old Material.—The volume is good, with an undercurrent of strength in prices. A number of good-sized inquiries are out for heavy melting steel, and several of last week's inquiries have materialized into orders. In addition there is an inquiry for a large tonnage of selected steel scrap, which if developed into actual orders will mean an immediate advance in the price of this commodity here. A strong demand still prevails for wrought

scrap, and shipments are moving freely in all lines. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$16.50 to $17.00
Low phosphorus steel	21.00 to 21.50
No. 1 railroad wrought scrap	18.00 to 18.50
No. 1 railroad and machinery cast scrap	15.25 to 15.75
Old steel axles	23.00 to 23.50
Old iron axles	23.00 to 23.50
Old carwheels	15.25 to 15.75
Railroad malleable	15.25 to 15.75
Machine shop turnings	7.75 to 8.25
Heavy axle turnings	12.00 to 12.50
Clean cast borings	9.25 to 9.75
Old iron rails	17.50 to 18.00
Locomotive grate bars	11.50 to 12.00
Stove plate (net ton)	10.00 to 10.50
Wrought pipe	13.00 to 13.50
Bundled sheet scrap	12.00 to 12.50
No. 1 busheling scrap	14.50 to 15.00
No. 2 busheling scrap	11.00 to 11.50
Bundled tin scrap	15.00 to 15.50

Cleveland

CLEVELAND, OHIO, Jan. 25, 1916.

Iron Ore.—The market has settled down to a state of inactivity, and sellers do not look for buying in any volume for some time. Some additional ore will be needed by a few of the furnace interests, but it is probable that these purchases will be delayed until the latter part of the season. With a heavy volume of orders on their books selling agencies are well satisfied with the situation. In fact sales have been so large that their season's business will be most satisfactory without further business. Mining companies have definitely decided to raise the wages of miners Feb. 1, and this advance in wages will average about 10 per cent, some companies making an advance of slightly over 10 per cent and others slightly less. This is in addition to the recent restoration of the 10 per cent cut that was made on the wages of miners in the Lake Superior district during the period of depression something over a year ago. The wages of employees on the lower lake docks and of employees on the lake boats will also be raised. We quote prices as follows, delivered lower lake ports: Old range Bessemer, $4.45; Mesaba Bessemer, $4.20; Old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.55.

Pig Iron.—While foundries in this territory are all crowded with work, most of them are covered for their first half requirements, and they are going slow in buying pig iron at the prevailing prices for last half delivery. While considerable foundry iron has been sold in Cleveland for last half delivery at $19 at furnace for No. 2, little outside business has been taken at that price, several outside inquiries not having resulted in orders. However, a fair sized outside inquiry would probably bring out an $18.50 price. For Cleveland delivery the market is firm at $19 at furnace for No. 2. The Valley furnace quotations range from $18.50 to $19, and in Toledo the minimum quotation for No. 2 foundry is $18.75 at furnace. We quote, delivered Cleveland, as follows:

Bessemer	$21.45 to $21.95
Basic	18.95 to 19.30
Northern No. 2 foundry	19.30
Southern No. 2 foundry	19.00 to 19.50
Gray forge	18.30
Jackson Co. silvery 8 per cent silicon	26.62
Standard low phos., Valley furnace	31.00

Coke.—The market is dull, and prices on foundry grades are firm at $3.50 to $4 per net ton at oven for best makes for prompt shipment, and $3.25 to $3.75 for contract. After the flurry due to car shortage a few days ago Connellsville furnace coke has settled back to about $3.50 for prompt shipment.

Finished Iron and Steel.—New demand is very active, particularly for plates. Considerable inquiry is coming out for round lots of steel for specific work. An illustration of the condition of the market is shown in the placing of an order with a Chicago warehouse by an Ohio manufacturer of steam shovels for 2000 tons of structural material, plates and steel bars at 2.45c., delivered, the buyer of the equipment assuming the extra cost for prompt delivery. It is understood that orders for four boats for Norway have been placed with a lake shipyard, in addition to the four reported ordered for the same country last week. These boats will require 1100 tons of steel each. Most mills are refraining from taking additional orders because of the large tonnage on their books, but some contracts are being closed with larger consumers at 1.90c., Pittsburgh, for third quarter for steel bars, plates and structural material. Local mills quote plates at 2.75c. to 3c., Pittsburgh, for prompt shipment, and some steel bars are being offered at 2.25c. to 2.50c., Pittsburgh, for early shipment. The demand for structural material has increased. The Nickel Plate Railroad received bids to-day for a bridge in Erie, Pa., requiring 530 tons, and a bridge in Ashland, Ky., requiring about 3000 tons, is about to be placed. Bids will be received early in February for approaches to a Louisville bridge requiring 11,000 tons. A new factory building to be built by the Parish & Bingham Company, Cleveland, will require 600 tons. The demand for blue annealed sheets is very heavy, and most mills are now asking the same prices for blue annealed as for black sheets. We quote No. 28 black sheets and No. 10 blue annealed sheets at 2.50c. to 2.75c., Ohio mill, and No. 28 galvanized sheets at 4.75c. to 5c. Hard steel bars are in good demand at 1.85c. to 2c., Pittsburgh. Warehouse prices have been advanced $2 per ton on steel bars and structural material, or to 2.60c.; $4 per ton on plates or to 2.70c.; to 3c. on blue annealed sheets and to 3.10c. on hoops. There has been a general advance on warehouse prices throughout the Central West.

Bolts, Nuts and Rivets.—The demand for bolts and nuts is heavy. Most consumers are now under contracts for first quarter so that orders are largely in the form of specifications on contracts. Prices are well maintained at the recent advances. The demand for rivets continues heavy, although specifications on contracts in this territory are coming out only in a moderate volume. We quote rivets at 2.60c., Pittsburgh, for structural and 2.70c. for boiler rivets for carload lots. We quote bolt and nut discounts as follows:

Common carriage bolts ⅜ & 6 in., smaller or shorter, roll thread, 70 off, cut thread, 65 and 10; larger or longer 60 and 5; machine bolts with h.p. nuts, ⅝ x 4 in., smaller and shorter, roll thread, 70 and 5; cut thread, 70, larger and longer, 60 and 10; lag bolts, gimlet or cone point, 70 and 10, square h.p. nuts, blank or tapped, $4 off the list; hexagon h.p. nuts blank or tapped, $4.20 off; c.p.c. & t. square nuts, blank or tapped, $3.75 off; hexagon nuts, 11 sizes, $4.75 off; cold pressed semi-finished hexagon nuts, all sizes, 75 and 10 off.

Old Material.—The lull that has existed since the holidays has disappeared and the market is fairly active and firmer. A Youngstown consumer came in the market last week for a large tonnage of heavy steel scrap, a considerable portion of which is understood to have been purchased. Local mills also are buying heavy steel scrap. The Cleveland price has advanced on this grade to a minimum of $16.50. Cast scrap, busheling and railroad wrought are $1 a ton higher and quotations on stove plates and grate bars have been advanced 50c. a ton. The consumption of steel-making scrap in Cleveland will be doubled by the starting up a few days ago of the new steel plant of Corrigan, McKinney & Co., which will consume 10,000 tons or more of scrap per month. This firm has recently been a heavy buyer. We quote f.o.b., Cleveland, as follows:

Per Gross Ton

Old steel rails	$15.75 to $16.00
Old iron rails	19.00
Steel car axles	25.00 to 26.00
Heavy melting steel	16.50 to 16.75
Old carwheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	14.00 to 14.25
Railroad malleable	17.00 to 17.25
Steel axle turnings	13.50 to 14.00
Light bundled sheet scrap	12.75 to 13.25

Per Net Ton

Iron car axles	$24.00 to $25.00
Cast borings	8.50 to 9.00
Iron and steel turnings and drillings	7.25 to 7.75
No. 1 busheling	14.50 to 15.00
No. 1 railroad wrought	18.00 to 18.50
No. 1 cast	14.00 to 14.50
Railroad grate bars	11.00 to 11.50
Stove plate	11.00 to 11.50

The Avery Company, Peoria, Ill., has acquired the plant formerly operated by the Kingman Plow Company of that city. In providing for the renewal of operations at that plant a further buying of raw materials will be necessary.

Birmingham

BIRMINGHAM, ALA., Jan. 24, 1916.

Pig Iron.—The market has passed an uneventful week. Prices are unchanged, makers being rather disposed to mark time for the next buying period. If anything is done under $15, it is warrant iron. A deal in warrant iron at $14.50 for a lot of 5000 tons was reported, but it turned out to be a buyer's offer at that figure, which was declined, and the trade was closed on a basis of $15. The week's business was mainly in small lots. The leading interest still names $15 for the first half and $16 for the second, but other makers demand $15.50 for first half and are doing some business on that basis. The volume of second half bookings is not believed to be large. The feature of the trade is the insistent call for prompt shipment. Furnace operators are hampered to a considerable extent by the scarcity of cars. Increase in pig iron and other freight movements is shown in the December report of the Alabama Car Service Association, cars moved being 80,113, as compared with 57,000 in December, 1914. The Gulf States Steel Company's furnace has resumed. We quote, per gross ton, f.o.b. Birmingham district furnace, as follows:

No. 1 foundry and soft	$15.50 to $16.00
No. 2 foundry and soft	15.00 to 15.50
No. 3 foundry	14.50 to 15.00
No. 4 foundry	14.25 to 14.75
Gray forge	14.00 to 14.50
Basic	15.00 to 15.50
Charcoal	23.00 to 23.50

Cast-Iron Pipe.—Manufacturers of water and gas pipe plants report quite a busy week, with the Middle West again a good source of orders. Several good-sized contracts from municipalities were received. Quotations continue at the recent advance. The sanitary pipe shops are doing well. The prospect in the entire pipe trade is thus very good. We quote, per ton, f.o.b. pipe shop yards, as follows: 4-in., $26; 6-in. and upward, $24, with $1 added for gas pipe.

Coal and Coke.—Coal business to Mobile and New Orleans on the Warrior River is showing a monthly increase. Prices are hardening. Coke is high and scarce, with almost all available ovens in operation. Brookwood coke commands $3.50 and $3.75 per net ton, f.o.b. oven, for run of ovens and hand-picked respectively, while Yolande 72-hr. hand-picked is ranging around $4. Furnace coke is firm at $2.75 to $3.

Old Material.—Cast scrap is rapidly taking the place of disappearing low-priced pig iron in foundry mixtures and the result is an increased demand with yards experiencing difficulty in meeting it. Inquiries are much better. Dealers are inclined to raise prices and will probably do so in the near future. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles	$14.50 to $15.00
Old steel axles	14.00 to 14.50
Old iron rails	13.50 to 14.50
No. 1 railroad wrought	10.50 to 11.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	9.00 to 9.50
No. 1 machinery cast	10.00 to 10.50
No. 1 steel scrap	10.00 to 10.50
Tram carwheels	10.00 to 10.50
Stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, MO., Jan. 24, 1916.

Pig Iron.—Sales have been mostly small lots from 100 tons down and mostly for early delivery, aggregating 2500 tons. The larger sales included 1000 tons of malleable charcoal iron and 500 tons of Northern No. 2 foundry.

Coke.—Representatives here of Connellsville ovens have been directed to withdraw from the market, while Virginia prices are put at $3.50 to $4 for best selected 72-hr. foundry coke and best 48-hr. coke at $3 to $3.25 per ton. By-product coke is quoted in parity with Connellsville and Virginia prices.

Finished Iron and Steel.—The advance to $1.90, Pittsburgh base, has had little effect on buyers, the problem continuing to be deliveries rather than the price. No promises are made as to deliveries, and the only satisfaction accorded buyers is that they may expect material somewhere in the third quarter at the earliest. Plates, harder to get than structural materials, are quoted at $2, with little disposition to contract at that. Fabricators report increasing prospects for work, and are endeavoring to make arrangements to accumulate stock, but are not succeeding. Bars are the same as structural material as to deliveries, both ordinary and reinforcing material. There is a good demand for light rails. Track fastenings are in good request for the season. Warehouses are reported very well supplied, and purchases are being freely made at the higher prices asked. We quote for material out of warehouse as follows: Soft steel bars, 2.55c.; iron bars, 2.50c.; structural material, 2.55c.; tank plate, 2.65c.; No. 10 blue annealed sheets, 2.85c.; No. 28 black sheets, cold rolled, one pass, 3.20c.; No. 28 galvanized sheets, black sheet gage, 5.20c.

Old Material.—As a result of embargoes, due to the rapid piling up of material in the mill and foundry yards, prices have fallen off about 25c., though the tone is firm, with dealers expecting activity at higher prices soon. Some dealers have been caught by the embargoes with demurrage cost, and this has had some effect on lots which needed immediate disposition. Lists out during the week include 2700 tons from the Chicago, Burlington & Quincy, 600 tons from the Chicago & Alton and 1000 tons from the Wabash. Relaying rails, especially those of the lighter weights, are in good demand at firm prices. We quote dealers' prices, f.o.b. St. Louis industrial district, consumers' works, as follows:

Per Gross Ton	
Old iron rails	$15.25 to $15.75
Old steel rails, rerolling	16.75 to 17.25
Old steel rails, less than 3 feet	16.25 to 16.75
Relaying rails, standard section, subject to inspection	21.00 to 23.00
Old carwheels	13.25 to 13.75
No. 1 railroad heavy melting steel scrap	15.25 to 15.75
Heavy shoveling steel	13.25 to 13.75
Frogs, switches and guards cut apart	15.25 to 15.75
Bundled sheet scrap	9.75 to 10.25

Per Net Ton	
Iron angle bars	$14.75 to $15.25
Steel angle bars	13.75 to 14.25
Iron car axles	19.75 to 20.25
Steel car axles	20.75 to 21.25
Wrought arch bars and transoms	16.75 to 17.25
No. 1 railroad wrought	14.25 to 14.75
No. 2 railroad wrought	13.75 to 14.25
Railroad springs	14.25 to 14.75
Steel couplers and knuckles	14.75 to 15.25
Locomotive tires, 42 in. and over, smooth inside	14.25 to 14.75
No. 1 dealers' forge	11.75 to 12.25
Mixed borings	8.25 to 8.75
No. 1 busheling	12.25 to 12.75
No. 1 boilers, cut to sheets and rings	9.75 to 10.25
No. 1 railroad cast scrap	12.75 to 13.25
Stove plate and light cast scrap	9.75 to 10.25
Railroad malleable	11.75 to 12.25
Agricultural malleable	10.25 to 10.75
Pipes and flues	9.75 to 10.25
Railroad sheet and tank scrap	9.75 to 10.25
Railroad grate bars	9.25 to 9.75
Machine shop turnings	9.75 to 10.25

New York

NEW YORK, Jan. 26, 1916.

Pig Iron.—The market is not active but strong. Inquiries are few but some quiet buying is noted. Sales by one broker of about 5000 tons the past week, which included a lot of about 3000 tons as well as other transactions, are reported. The embargo to New England has been lifted by the New York, New Haven & Hartford, but it has been the cause of great inconvenience both to consumers and sellers and many plans have been resorted to to get pig iron to the foundries. Besides shipments by water to various ports and by roundabout rail routes, one consumer took iron by trucks across the country from a Sound port. Another seller was able to get iron to Boston by water where some spot sales were easily made at good prices. At least two foundries have been obliged to shut down, with others on the verge of doing so, but the situation is regarded as easier, at least temporarily. Activity in melting is reported in every direction and in New Jersey some spot sales of 250 to 500 tons are noted. Sales of Buffalo No. 2 X have been made as high as $19, furnace. Coke is advancing almost daily, sales being reported at $5 per net ton at oven for spot foundry coke and $4.50 on contract. Higher prices are regarded as not impossible if railroad strike possibilities mate-

rialize. We quote at tidewater as follows for early delivery: No. 1 foundry, $20.25 to $20.75; No. 2 X, $19.75 to $20; No. 2 plain, $19 to $19.25. Southern iron at tidewater, $20 to $20.50 for No. 1 and $19.50 to $20 for No. 2 foundry and No. 2 soft.

Ferroalloys.—Ferromanganese is strong with spot material having been sold at $175, seaboard, but the nominal quotation on contract is $125, seaboard. One representative of British producers will accept no orders this side of the fourth quarter and others have withdrawn from the market until May or June. Domestic producers are also understood to have no material for sale this side of July 1. Some British spot material is reported as negotiated for at $175, seaboard. Not much anxiety is evident, though some consumers are not supplied for a long time ahead. Imports in December at the four principal Atlantic ports were 6005 gross tons, which is nearly 50 per cent larger than October or November receipts, but the total for the last quarter is the lowest for any quarter of the year except the first when the embargo was in effect. Considerable inquiry is noted for spiegeleisen, with one producer now asking $32.50, furnace, for the 20 per cent grade. It is understood that considerable is being used in place of ferromanganese for certain munition steel, as well as large quantities of 50 per cent ferrosilicon. The latter alloy is very strong and active, with sales by a new producer at $90 to $96, furnace. A company manufacturing ferroalloys has been offered $100 per ton to turn its electric furnaces to making high grade ferrosilicon.

Structural Material.—A few additional cases of deferred consideration of building projects and the slowness of the buying of bridges by railroads are attributed in a large part to the high prices. Charges for fabrication and erection have not, however, kept pace with the advances in plain material, and it is believed that the cost of the finished steel structure is not, on the average, so high at this time as it was in 1906, when railroads, for example, were heavier buyers. When the railroads reach the scale of net income that was ruling nine or ten years ago, it is felt that the demands for fabricated steel will materially increase. As it is now many fabricators in the East are desirous of work. A moderate volume of business is going into relatively small railroad bridge work, but the greater amount for the time being is for industrial plant extensions, with investment and speculative general building work at a somewhat low ebb. Among industrial buildings recently closed may be mentioned a mill building for L. P. Thomas & Son, Paulsboro, N. J., 400 tons, taken by the Pennsylvania Steel Company; 200 tons for McIlvaine & Co., Philadelphia, placed with Morris, Wheeler & Co.; and 700 tons closed for Worth Brothers Company, in connection with its furnace department, and 450 tons placed with the Levering & Garrigues Company for addition to the machine shop of the Midvale Steel Company. The additional shop for the Baldwin Locomotive Company at Philadelphia, placed with the McClintic-Marshall Company, amounting to 1250 tons, may, it is understood, be increased to 4000 tons. The Standard Oil Company is in the market for a coal trestle at Baltimore, taking 600 tons; the J. G. Brill Company for a car shop at Cleveland, taking 700 tons. In railroad work, the Grand Trunk is inquiring for 300 tons of bridge work; while the Pennslyvania has closed for a like tonnage of bridge material. The American Bridge Company has taken 200 tons for a transfer bridge for the Baltimore & Ohio at Baltimore; the New York Central has closed for 400 tons at Oswego, awarded to the Phoenix Bridge Company, and it is likely to close shortly for 500 tons of beam bridges. The Delaware & Hudson office building at Albany, requiring 600 tons, is thought likely to go to the Phoenix Bridge Company, which, it is also believed, will erect a 600-ton structure adjoining for the Albany *Journal*. About 3000 tons of the steel for the Interborough subway extension on which general bids were recently taken remains to be placed, 9000 tons having been awarded the American Bridge Company. Among general buildings, Milliken Brothers, Inc., has closed for 450 tons for the Mohican Hotel alterations at New London and has under consideration the Winthrop Building, Springfield, Mass., 700 tons. A building at Middletown, N. Y., 300 tons, is to be built for the Merchants' National Bank. Plain material is obtainable from the mills in six or more weeks at 2.069c. to 2.169c., New York, but from the warehouse at 2.60c., New York, the price in the case of the store business having advanced $2 a ton within the last week.

Steel Plate.—Mills find themselves loaded with definite orders to a greater extent than reported last week, so that it is more difficult than ever to place tonnage business for delivery prior to Aug. 1. One Eastern mill has withdrawn prices and has actually resorted to a quotation of 3c. in the effort to check demand. One other mill is still asking 2.50c., Pittsburgh, and another has quoted recently for several weeks delivery at 2.35c. The Texas Company, it is understood, has closed for 6400 tons for the four ships which it is planning to build in the ship yard recently acquired at Bath, Me. At least one large project, taking 10,000 tons of plates, has been discontinued indefinitely on account of present high prices. No interest is taken in export. Meanwhile demand on account of railroad cars does not look exceptionally bright, and for some time it is felt that the railroad placing of cars will be somewhat quiet. We quote mill shipments of plates at 2.519c., New York, and higher in several weeks, 2.169c. to 2.669c., New York, in the third quarter and 2.90c., New York, from warehouse, the warehouse price having in the last two weeks advanced $6 a ton.

Iron and Steel Bars.—The intermittent embargoes have not helped the situation in point of delivery, as they have worked toward delaying mill operations, so that steel bars are harder than ever to get. The result has been a further extension of deliveries also of bar iron, where this has been substituted for steel; and for some relatively small lots and prompt shipments, prices for bar iron compare with the prices obtained for steel plates. Now and then a small lot of steel bars is heard of closing for delivery in several weeks at prices 2.10c., Pittsburgh, and higher, but most of the urgent business has to be taken from the warehouses which advanced prices $2 a ton. About 11,000 tons of spikes and perhaps 3000 tons of additional material such as track accessories is about to be closed in connection with the rails in the market for Russia. We quote mill shipments of steel bars at 2.169c., New York, for delivery as the mill can make it and mill shipments of iron bars at 2.269c., New York, in an average of about six to eight weeks. Steel and iron bars from warehouse are quoted at 2.60c., New York.

Cast-Iron Pipe.—The market is featureless. Buying by private gas and water companies continues, but no new municipal lettings are announced. Prices are well maintained. Carload lots of 6-in., class B and heavier, are quoted at $29 per net ton, tidewater, class A and gas pipe taking an extra of $1 per ton.

Old Material.—Conditions show little change. Transactions are few and small. Heavy melting steel scrap is firm but rolling-mill stock is inclined to weakness because of embargoes placed by railroads in localities having important rolling mills. Relaying rails are in better demand and higher. Brokers are paying about as follows to local dealers and producers, per gross ton, New York:

No. 1 heavy melting steel scrap	$14.00 to $14.50
Relaying rails	.... 23.50
Rerolling rails	15.00 to 15.50
Iron car axles	25.00 to 25.50
Steel car axles	23.50 to 24.00
No. 1 railroad wrought	20.00 to 20.50
Wrought-iron track scrap	17.50 to 18.00
No. 1 yard wrought, long	15.50 to 16.00
No. 1 yard wrought, short	14.00 to 14.50
Light iron	6.25 to 6.50
Cast borings	8.50 to 9.00
Wrought turnings	7.50 to 8.00
Wrought pipe	13.25 to 13.50
Old carwheels	14.00 to 14.50
Malleable cast (railroad)	12.50 to 13.00

Foundries are buying cast scrap more freely. Some foundries have evidently permitted their stocks to run too low. Dealers' quotations to consumers of cast scrap are as follows, per gross ton, New York:

No. 1 cast (machinery)	$17.00 to $17.50
No. 2 cast (heavy)	16.00 to 16.50
Stove plate	11.50 to 12.00
Locomotive grate bars	11.50 to 12.00

Maximum British Prices

Export Business Practically Suspended—Tungsten Steel Quotations Fixed

(*By Cable*)

LONDON, ENGLAND, Jan. 26, 1916.

Maximum prices for home trade are engrossing attention. Steel boiler plates are fixed at £12 10s., ship and bridge plates at £11 10s., joists and angles at £11 2s. 6d., net on trucks, but there are no sellers offering anything anywhere near these prices. A protest by the Welsh steel makers will probably result in raising the maximum for Welsh bars to £11, but there are eager buyers at £11 10s. and business has been done at £12.

Export business is practically suspended. Tool steel has been fixed at 2s. 10d. for 14 per cent tungsten content based on tungsten ore at 55s. and at 3s. 10d. for 18 per cent tungsten steel. Pig iron is strong and stocks are falling. We quote prices, which are mostly nominal, as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 25s. 6d. upwards.

Cleveland pig iron warrants, 81s. 7½d., against 80s. last week.

No. 3 Cleveland pig iron, maker's price, f.o.b. Middlesbrough, 76s. 9d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £18.

Steel rails, export, f.o.b. works port, £11 5s. nominal.

Hematite pig iron, f.o.b. Tees, about 135s.

Ferromanganese, f.o.b., £25, loose.

Ferrosilicon, 50 per cent, c.i.f., £27.

American Brass Company's Huge Earnings

The American Brass Company, which is claimed to be the world's largest copper consumer, has issued its annual report for the year ended Dec. 31, 1915, from which the following table is taken showing the surplus account for the year, as compared with the preceding year:

	1915	1914
Surplus Jan. 1	$8,599,551	$8,049,204
Less dividends paid	1,950,000	900,000
Balance	$6,649,551	$7,149,204
Net earnings for year	6,128,454	1,450,347
Surplus Dec. 31	$12,778,005	$8,599,551

The net divisible profits for 1915 shown above, $6,128,454, represented an increase of 322 per cent over 1914, when the net profits were only $1,450,347. The best previous year was 1912, when the profits amounted to $2,274,738.

Bethlehem Declares Common Stock Dividend

The directors of the Bethlehem Steel Corporation at their meeting held Jan. 20 declared a 30 per cent dividend on the $15,000,000 of common stock, payable out of the earnings of 1915 in quarterly instalments on April 1, July 1, Oct. 1, 1916, and Jan. 3, 1917. On the same dates the instalments of 1¾ per cent on the regular preferred dividend will be paid. After the meeting it was announced that a 10 per cent increase would be made in wages of unskilled workmen, this advance affecting about 10,000 men.

The Blast Furnace and Coke Association of the Chicago District has been organized, embracing a membership to include the operatives of all the local blast furnace and coke plants. It will hold meetings every two months for the presentation of papers and discussions. David L. Ward is president; W. H. Allen, vice-president; C. J. Bacon, secretary and treasurer. In addition, H. W. Howland and E. L. Ives are members of the executive board.

The Texas Steel Company is being organized with a capital stock of $2,500,000 for the purpose of building an iron and steel plant at Beaumont. The company will take over extensive iron-ore deposits in Cass County, Tex.

Iron and Industrial Stocks

NEW YORK, Jan. 26, 1916.

The stock market of the past week has been to a great extent dominated by depressing influences. Among these have been the sales of stocks on foreign account, attacks on war order stocks and persistent rumors, now shown to be unfounded, that the directors of the Steel Corporation would again pass the dividend on the common stock. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	25⅜	- 28	
Allis-Chal., pref.	75½	- 80	
Am. Can, com.	61½	- 64⅛	
Am. Can, pref.	112½	-112¾	
Am. Car & Fdy., com.	67⅛	- 70	
Am. Loco., com.	63	- 65¾	
Am. Loco., pref.	101¼	-102	
Am. Steel Fdries.	55½	- 58	
Bald. Loco., com.	105¼	-111¼	
Bald. Loco., pref.	108½		
Beth. Steel, com.	455	-492⅞	
Beth. Steel, pref.	130	-145	
Colorado Fuel	44½	- 48	
Deere & Co., pref.	96	- 96¼	
General Elec.	171½	-176½	
Gt No. Ore Cert.	45½	- 48¾	
Int. Harv. of N. J., com.	109¾	-112	
Int. Harv. of N. J., pref.	116	-119½	
Lacka. Steel	77⅜	- 82	
Nat. En. & Stm., com.	26¾	- 27⅞	
Nat. En. & Stm., pref.	92	- 94	
N. Y. Air Brake	146	-152⅞	
Pressed Stl., com.	56⅜	- 59½	
Ry. Steel Spring, com.	38	- 42	
Ry. Steel Spring, pref.	99		
Republic, com.	50	- 52	
Republic, pref.	108	-108⅞	
Sloss, com.	55½	- 60¼	
Pipe, com.	21	- 22	
Pipe, pref.	49	- 51	
U. S. Steel, com.	82⅜	- 85⅜	
U. S. Steel, pref.	117⅝	-118⅝	
Va. I. C. & Coke	57	- 57½	
Westing. Elec.	66⅜	- 68⅜	
Am. Rad., com.	391	-393	
Am. Rad., pref.		-136	
Am. Ship, com.	35	- 35¼	
Am. Ship, pref.	75⅝	- 76	
Chic. Pneu. Tool	70	- 75½	
Cambria Steel	70¼	- 75	
Lake Sup. Corp.	8½	- 10¼	
Pa. Steel, pref.	81	- 81½	
Warwick	10¼	- 10⅝	
Cruc. Steel, com.	63¾	- 69½	
Cruc. Steel, pref.	110	-110⅝	
Harb. Walk. Refrac., com.	75	- 77½	
Harb. Walk. Refrac., pref.		-100	
La Belle Iron, com.	50	- 52	
La Belle Iron, pref.		-123	
Am. Brit. Mfg., com.	25½	- 42	
Can. Car & Fdy., com.	70	- 72	
Can. Car & Fdy., pref.	90	- 93	
Carbon Stl., com.	65	- 68	
Central Fdy., com.		11	
Cent. Fdy., pref.	25	- 28	
Driggs-Seabury	130	-145	
Midvale Steel	68⅝	- 70½	

Dividends

The American Brass Company, regular quarterly, 1½ per cent, and extra 3½ per cent, payable Feb. 1.

The Bethlehem Steel Company, quarterly, 7½ per cent on the common stock, and 1¾ per cent on the preferred stock, payable April 1.

The Dominion Bridge Company, regular quarterly, 2 per cent, and extra 3 per cent, payable Feb. 15.

The Pullman Company, quarterly, 2 per cent, payable Feb. 15.

The United State Cast Iron Pipe & Foundry Company, quarterly, ½ of 1 per cent, payable Feb. 15, May 15, Aug. 15 and Nov. 15. Dividends were suspended in 1915 and 2 per cent was paid in 1914.

The Cambria Steel Company has decided to call all its scrip now outstanding, payable on demand.

The Cleveland-Cliffs Iron Company, regular quarterly, 2½ per cent, and a stock dividend of 50 per cent, payable Jan. 25.

The Taylor-Wharton Iron & Steel Company, regular quarterly, 1¾ per cent on the preferred stock, payable Jan. 24.

The United States Steel Corporation, regular quarterly, 1¾ per cent on the preferred stock, payable Feb. 28, and 1¾ per cent on the common, payable March 30.

The National-Acme Mfg. Company, Cleveland, Ohio, at a meeting of its stockholders Jan. 20, approved an increase of its capital stock from $2,500,000 to $9,000,000. Of the new stock $1,500,000 preferred has been sold, leaving $5,000,000 common stock in the treasury. A stock dividend of 100 per cent will be declared to holders of the old stock. The increase in capital stock was made largely to provide for extensions at the Cleveland plant and to finance the recent purchase of the Windsor Machine Company, Windsor, Vt.

The United Steel Company, Canton, Ohio, a few days ago distributed $32,000 among its employees as their share of the company's profits the past year. Under the profit-sharing plan which has been in operation two years, the employees receive 4 per cent of their annual earnings after they have been in its service a year, and the profits distributed increase with the length of service until the employees get 10 per cent of their earnings annually.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 73.9c. on plates, structural shapes and sheets and 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal is 56.9c.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 1.90c. to 2.25c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 2c. to 2.25c., base, net cash, thirty days. Following are stipulations prescribed by manufacturers:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated Feb. 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3/16 in. take the price of 3/16. in.

Allowable overweight, whether plates are ordered to gage or weight to be governed by the standard specifications of the Association of American Steel Manufactures.

Extras	Cents per lb.
Gages under ¼ in. to and including 3/16 in.	.10
Gages under 3/16 in. to and including No. 8	.15
Gages under No. 8 to and including No. 9	.25
Gages under No. 9 to and including No. 10	.30
Gages under No. 10 to and including No. 12	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths under 3 ft. to 2 ft., inclusive.	.25
Cutting to lengths under 2 ft. to 1 ft., inclusive.	.50
Cutting to lengths under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Rods.—Bessemer, open-hearth and chain rods, $45, nominally.

Wire Products.—Prices to jobbers, effective Jan. 24: Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, $2.05; galvanized, $2.75. Galvanized barb wire and staples, $3.05; painted, $2.35. Wire nails, $2.20. Galvanized nails, 1 in. and longer, $2 advance over base price; shorter than 1 in., $2.50 advance over base price. Woven wire fencing, 64½ per cent off list for carloads, 63½ off for 1000-rod lots, 62½ off for less than 1000-rod lots.

The following table gives the price per 100 lb. to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$2.10	$2.15	$2.20	$2.25	$2.40	$2.50	$2.60	$2.70
Galvanized	3.00	3.05	3.10	3.15	3.20	3.35	3.70	3.80

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from Jan. 20, 1916, on iron and steel black and galvanized pipe, all full weight:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	69	43½	⅛ and ¼	58	32
½	73	56½	⅜	59	33
¾ to 3	76	60½	½	63	43
			⅝ to 1½	66	48
			2	65	47

Lap Weld

2	73	57½	1¼	50	32
2½ to 6	75	59½	1½	61	43
7 to 12	71	54½	2	62	45
13 and 14	60½	..	2½ to 4	64	48
15	58	..	4½ to 6	64	48
			7 to 12	62	46

Reamed and Drifted

1 to 3, butt	74	58½	1 to 1½, butt	64	46
2, lap	71	55½	2, butt	63	45
2½ to 6, lap	73	57½	1½, lap	48	30
			1½, lap	59	41
			2, lap	60	43
			2½ to 4, lap	62	46

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	65	48½	⅜	57	40
½	70	57½	½	62	48
¾ to 1½	74	61½	¾ to 1½	66	50
2 to 3	75	62½	2 and 2½	66	50

Lap Weld, extra strong, plain ends

2	71	56½	1½	60	44
2½ to 4	73	58½	2	63	46
4½ to 6	72	57½	2½ to 4	65	49
7 to 8	67	50½	4½ to 6	64	48
9 to 12	62	45½	7 to 8	57	41
			9 to 12	52	36

Butt Weld, double extra strong, plain ends

½	61	48½	½	52	37
¾ to 1½	64	51½	¾ to 1½	55	40
2 to 2½	66	53½	2 and 2½	56	41

Lap Weld, double extra strong, plain ends

2	62	49½	2	53	37
2½ to 4	64	51½	2½ to 4	55	42
4½ to 6	63	50½	4½ to 6	53	40
7 to 8	57	40½	7 to 8	46	30

To the large jobbing trade an additional 5 per cent is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Sheets.—Makers' prices for mill shipment on sheets, of U. S. standard gage, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	2.50 to 2.60
Nos. 9 to 10	2.60 to 2.75
Nos. 11 and 12	2.60 to 2.75
Nos. 13 and 14	2.65 to 2.75
Nos. 15 and 16	2.75 to 2.85

Box Annealed Sheets, Cold Rolled

Nos. 10 and 11	2.25
No. 12	2.25
Nos. 13 and 14	2.30
Nos. 15 and 16	2.35
Nos. 17 to 21	2.40
Nos. 22 and 24	2.45
Nos. 25 and 26	2.50
No. 27	2.55
No. 28	2.60
No. 29	2.65
No. 30	2.75

Galvanized Sheets of Black Sheet Gage

Nos. 10 and 11	3.75 to 4.00
No. 12	3.85 to 4.10
Nos. 13 and 14	3.85 to 4.10
Nos. 15 and 16	3.95 to 4.20
Nos. 17 to 21	4.10 to 4.35
Nos. 22 and 24	4.30 to 4.55
Nos. 25 and 26	4.45 to 4.70
No. 27	4.60 to 4.85
No. 28	4.75 to 5.00
No. 29	4.90 to 5.15

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination, added, on lap-welded steel tubes, in effect from Jan. 14, 1916, and standard charcoal-iron tubes, effective from Jan. 20, 1916, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1½ in.	43	1½ in.	38 to 39
1¾ and 2 in.	55	1¾ and 2 in.	42 to 43
2¼ in.	52	2¼ in.	39 to 40
2½ and 2¾ in.	58	2½ and 2¾ in.	46 to 47
3 and 3¼ in.	63	3 and 3¼ in.	50 to 51
3½ to 4½ in.	64	3½ to 4½ in.	52 to 53
5 and 6 in.	57	5 and 6 in.	46 to 47
7 to 13 in.	54		

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Jan.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
19	24.50	23.87½	41.12½	5.90	5.82½	18.62½	18.37½
20	24.50	24.12½	41.50	5.90	5.82½	18.75	18.50
21	24.75	24.50	41.87½	6.10	6.00	18.87½	18.62½
22	25.00	24.87½	42.00	6.10	6.00	19.00	18.75
24	25.50	25.37½	42.25	6.10	6.00	19.00	18.75
25	25.50	25.37½	42.12½	6.10	6.00	19.25	19.00

NEW YORK, Jan. 26, 1916.

Copper has advanced sharply under a heavy export demand. In tin there has been occasional good buying of futures; spot is scarce and the market is higher. Lead, for which the export demand has been heavy also, is firm at higher levels. An active market has caused spelter to advance. Antimony is quiet at unchanged quotations.

New York

Copper.—Under the influence of heavy and sustained export buying, quotations have advanced rapidly and the earliest deliveries of electrolytic obtainable, which are two or three months away, are quoted at 25.37½c., cash, New York. For spot electrolytic up to 26c. has been asked. Lake is entirely nominal at about 25.50c., cash. The French Government has been a very large buyer, one of its inquiries being for 10,000 tons for delivery over a period of several months. The Russian Government has been active also. Last Friday the market was greatly excited and very uncertain because of reports emanating from Boston which said that 30c. had been offered. The rumors were untrue, but helped to send quotations upward. This week the market has been a little quieter because of the higher prices, but some large business, mostly for export, is pending. Rolling mills that buy raw copper cast in special shapes and not in ordinary ingot form have suffered great distress recently because of the railroad freight embargoes, as without these special shapes they cannot roll their products. The exports this month, including yesterday, total 18,543 tons.

Tin.—At various times the market has been fairly active, but the business was largely restricted to tin afloat or future shipments from the Far East. While the arrivals of tin are of generous proportions, only a little of it is available for spot sales. Consumers have come to realize the uncertainty of the supply, and are buying further ahead than has been their custom in time past. Few of them who use the metal in large quantities have failed to cover their needs for from two to six months ahead. Consequently spot metal is scarce. The quotation yesterday was 42.12½c. The arrivals this month, including yesterday, total 3505 tons and there was afloat 5775 tons.

Lead.—Up to last Friday lead was rather irregular both in New York and London, but the foreign market took an upward turn, and the New York price was advanced to 6.10c. The St. Louis price went to 6c. The incident is taken to indicate how thoroughly the foreign market dominates the situation, and the fact that London must be watched is emphasized. The foreign demand has been heavy, and large purchases are yet to be made. The exports this month, including yesterday, total 3355 tons.

Spelter.—Both inquiry and buying for nearby and first half spelter have been active, and quotations have advanced steadily, those of yesterday being 19.25c., New York, and 19c., St. Louis. In this metal, also, the London market has been a factor inasmuch as it is higher and very strong. The demand from the galvanizing trade continues at low ebb. The call for brass mill special is very heavy and it is quoted at about 21c. It is the opinion of some of the trade that producers of prime Western are proceeding on the basis that it is better for them to sell a limited quantity at a high price than three times as much at one-third of the price. The exports continue at a good rate, those of this month, including yesterday, amounting to 3914 tons.

Antimony.—The market is quiet but firm with Chinese and Japanese grades quoted at 42c. to 42.50c., duty paid, for spot shipments.

Aluminum.—For No. 1 virgin, 98 to 99 per cent pure, the quotation is unchanged at 53c. to 55c.

Old Metals.—The market continues firm. Dealers' selling prices are unchanged, as follows:

	Cents per lb.
Copper, heavy and crucible	21.00 to 22.00
Copper, heavy and wire	20.50 to 21.00
Copper, light and bottoms	18.00 to 18.50
Brass, heavy	13.00 to 13.50
Brass, light	11.00 to 11.50
Heavy machine composition	15.50 to 16.00
No. 1 yellow rod brass turnings	14.00 to 14.50
No. 1 red brass or composition turnings	14.50 to 15.00
Lead, heavy	5.25
Lead, tea	5.00
Zinc	12.00 to 14.00

Chicago

JAN. 24.—The usual relations between the local market and those of the East are being deranged by reason of shipping congestion, which has set up purely local conditions. The market continues to move upward, and prices closely approach high record levels. We quote: Casting copper, 24½c.; Lake copper, 25½c.; tin, carloads, 42½c., and small lots, 44½c.; lead, 6.02½c.; spelter, 19½c.; sheet zinc, nominally, 23c.; Cookson's antimony, 50c.; other grades, 45c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 18.50c.; copper bottoms, 17.75c.; copper clips, 18.50c.; red brass, 16.75c.; yellow brass, 14.75c.; lead pipe, 5c.; zinc, 13.75c.; pewter, No. 1, 26c.; tinfoil, 34c.; block tin pipe, 38c.

St. Louis

JAN. 24.—Non-ferrous metals are higher and are quotable to-day as follows: Lead, 6.25c.; spelter, 20c.; tin, 45c.; lake copper, 26c.; electrolytic copper, 25.50c.; antimony, 45c. In the Joplin ore market prices worked up sharply at the close of the week, with zinc blende ranging from $90 to $120 per ton, with the choicest ores reaching $123; calamine, from $70 to $80; lead ore, $80. The average prices for the week's production of the district were: Zinc blende, $104; calamine, $76; lead, $77. Miscellaneous scrap metals are quoted as follows: Light brass, 8c.; heavy yellow brass, 10.50c.; heavy red brass, and light copper, 11.50c.; heavy copper and copper wire, 14c.; zinc, 8c.; lead, 4c.; pewter, 22c.; tinfoil, 30c.; tea lead, 3.05c.

Vocational Education Survey of Richmond, Va.

A report on a vocational education survey of Richmond, Va., has been published by the United States Bureau of Labor Statistics, Department of Labor, as its bulletin 162. The survey was made under the auspices of the National Society for the Promotion of Industrial Education with the co-operation of the United States Bureau of Labor Statistics, the United States Bureau of Education, the Russell Sage Foundation and the school authorities and citizens of Richmond. The survey committee recommended the organization of evening and part-time schools and courses for boys and men already employed, and outlined general and industrial courses for the trades which the survey had covered.

A maximum price for ferrotungsten for steel-making purposes in Germany is reported as fixed at 35 marks per kilogram of contained tungsten. This is about $4.17 per lb. and is much higher than prices in England but lower than those prevailing in the United States.

Tin exports from the Federated Malay States in November, 1915, were 4059 tons, which compares with 4085 tons in November, 1914. The total for the 11 months of 1915 to Dec. 1 is 42,696 tons, against 44,691 tons to Dec. 1, 1914, and 45,513 tons to Dec. 1, 1913.

Exports of Ingots, Billets and Blooms at Record Rate

Exports from the United States of steel ingots, billets and blooms are at present at the greatest rate of any time on record. The following table, compiled from Government data, is illuminating of the extent of these exports:

	Gross Tons	Gross Tons Per Month
August, 1915	89,134	
September, 1915	54,782	62,440
October, 1915	43,405	
10 months ended Oct. 31, 1915	451,306	45,130
10 months ended Oct. 31, 1914	40,033	4,003
10 months ended Oct. 31, 1913	88,563	8,856
Fiscal year ended June 30, 1914	46,926	3,910
Fiscal year ended June 30, 1913	230,728	19,227
Fiscal year ended June 30, 1912	234,381	19,532
Fiscal year ended June 30, 1910	51,554	4,296

The present export rate of 62,440 tons per month for the last three months of which we have any official data compares with 19,532 tons per month in the previous record year of 1912. The total of 451,306 tons to Nov. 1, 1915, is nearly twice the exports for the fiscal years of 1912 or 1913, record years. The low tide of exports was in the fiscal year of 1914, only 46,926 tons per month. Of the total exports to Nov. 1, 1915, Great Britain has taken 334,115 tons, or 74 per cent.

Imports into this country, on the other hand, have dwindled decidedly during the war. In October, 1915, they were only 946 gross tons and to Nov. 1, 1915, total imports of steel ingots, billets, blooms and slabs were 10,218 tons, which compares with 35,557 tons to Nov. 1, 1914, and 20,558 tons to Nov. 1, 1913.

Consulting British statistics it is found that the total imports of blooms, billets and slabs for the eleven months of 1913 to Dec. 1, were 464,465 gross tons, as contrasted with 405,898 tons to Dec. 1, 1915. Of these 1913 imports 275,469 tons came from Germany, while in 1915 the United States furnished 329,606 tons of the total, more than displacing Germany's relative contribution.

Record Exports of Ferrovanadium

Ferrovanadium exports in October, 1915, were 166,972 lb., which made the total 815,835 lb. to Nov. 1, compared with 670,255 lb. to Nov. 1, 1914. This 1915 total exceeds by 30 per cent the previous record, which was 626,641 lb. for the fiscal year ended June 30, 1914, and 620,765 lb. of this went to Europe. In the fiscal year of 1911, the first record of exports, the total was only 107,418 lb. Because of the high price of aluminum the quotation for ferrovanadium has advanced from $2 to $3 per pound of contained vanadium.

William Wharton, Jr., & Co., Inc., announce the opening of their general offices at Easton, Pa. A Philadelphia sales office has been opened in the Widener Building in charge of R. C. McCloy, as Southeastern sales manager. The new site at Easton contains 100 acres of ground, of which 10 acres are now covered by fireproof buildings, equipped with machinery especially designed for the production of steam and electric railroad special track work. The plant has a modern iron and steel foundry and a large forge shop, equipped to handle commercial castings and forgings.

The Otis Steel Company, Cleveland, Ohio, will start its Riverside works in that city within the next 60 days. This plant, completed in 1914, was operated only a short time, being then shut down because of business depression, and the delay in starting it up since the revival of the steel industry has been due to the scarcity of sheet bars. These will be furnished by the new steel plant of Corrigan, McKinney & Co. The principal products of the Riverside works are light plates and blue annealed sheets.

The furnace of the Empire Steel & Iron Company, at Oxford, N. J., was blown out last week for relining. The bricks for the work are on the ground and the castings are ready to be shipped, and it is not expected that the furnace will be idle more than six or eight weeks. It has been producing 225 tons a day.

Trumbull Company to Build Steel Plant

The Trumbull Steel Company, Warren, Ohio, has decided to erect an open-hearth steel plant in connection with its sheet mills. At present the company buys its sheet bars in the open market. It is now increasing its finishing capacity, which will be used largely for making high-grade sheets and tin plate of special analysis, and the proposed steel plant will be used to manufacture sheet bars to be rolled into special products. By thus specializing it is stated that the plan to a large extent will be non-competitive with any steel plant in the Valley district. In addition to its steel plant the company expects to add another finished line to its present products of black and galvanized sheets and tin plate. When the extensions are completed it will have a capacity of approximately 275,000 tons of finished products a year, for which it will make that part of its semi-finished steel that it is unable to buy on the open market.

While the steel plant will probably consist of several open-hearth furnaces and a blooming and sheet-bar mill, no definite details will be decided upon until a meeting of the stockholders, which will be held Feb. 23, to vote on an increase in the authorized capital stock from $4,000,000 to $10,000,000. It is expected, however, that only $2,000,000 in additional stock will be issued at first, that being the amount the company plans to use in erecting its steel plant. The remainder will be issued later for further extensions.

Furnace Revival at St. Louis

Plans previously reported in THE IRON AGE for the re-establishment of the pig-iron industry at St. Louis, Mo., have reached the definite stage of incorporation at Wilmington, Del., the chief interest being that of Edward F. Goltra, of the Missouri Iron Company, controlling ore areas in southeastern and southwestern Missouri. The principal supplies of ore, however, will be drawn from deposits controlled in the vicinity of Waukon, Iowa, estimated to contain about 10,000,000 tons of ore. The new company will be known as the Mississippi Valley Iron Company, and it is probable that Mr. Goltra will be its first president. The capitalization is $5,000,000. Others interested are Jesse D. Dana, John C. Roberts, R. H. Stockton, E. C. Dameron, William Bagnell, David R. Francis, P. C. Maffitt and T. C. Maffitt, all large local capitalists.

The company will expend about $300,000 in the immediate rehabilitation of the old St. Louis Blast Furnace Company's property, embracing the old Vulcan Iron Works, and will increase the capacity to an output of 600 tons of pig iron per day. The plant is near the new coke ovens of the Laclede Gas Light Company. Cheap transportation for both coke and ore is an advantage relied upon as well as the development of a new process, and it is asserted that the reconstructed plant will be able to produce pig iron $2 per ton cheaper than it can be delivered in St. Louis from any other source.

Corrigan, McKinney & Co., Cleveland, Ohio, started operations in their new steel plant Jan. 20. Two of the open-hearth furnaces were started and the other six will be in operation within the next few weeks. The blooming mill and sheet-bar and billet mill are not yet ready for operation but will be started about April 1. The ingots produced in the open-hearth plant will be stored until the blooming and bar mills are started. The firm's third blast furnace will be ready to blow in about May 1.

The American Stamping & Enameling Company, Massillon, Ohio, has placed the stamping department of its new plant in full operation. Its enameling department will be moved to Massillon shortly from its old works in Bellaire, Ohio.

The Chicago Iron & Chemical Company, Chicago, Ill., reported to have a capital of $2,000,000, has acquired iron-ore lands in the vicinity of Poplar Bluff, Mo., with the expectation of building two 100-ton charcoal furnaces.

PERSONAL

Werner Nygren, with the consent of his partners, has withdrawn from the firm of Nygren, Tenney & Ohmes, New York, and has established independent offices for the practice of consulting engineering in steam power, heating and ventilating installations at 101 Park Avenue, New York City.

Ignacio Guerra C., manager of J. Crasemann Sucrs, Merida, Yucatan, Mexico, is visiting our manufacturing centers. He is desirous of making connections with manufacturers of machinery, mill supplies and hardware. Catalogs sent now in care of the General Export & Commission Company, New York, will reach him before he returns home. He is especially interested in obtaining an agency for charcoal gas and crude oil engines.

Walter M. Taussig, president of Wiebusch & Hilger, Ltd., New York, and of the Challenge Cutlery Corporation, while retaining his interests in these companies and remaining with them in an advisory capacity, has become a director and officer of the American Chain Company, Bridgeport, Conn., and his activities will hereafter be largely in connection with that company. Wiebusch & Hilger, Ltd., formerly sold the products of the American Chain Company to the merchant trade, but since the consolidation of the latter with the Weed Chain Tire Grip Company all products have been marketed directly. Wiebusch & Hilger, Ltd., retain all other agencies, and the business will be under the management of P. L. Van Alstyne, who has been elected treasurer.

D. E. Woodbridge and W. G. Swart, mining engineers, are establishing an experimental laboratory in West Duluth, Minn., with a view to perfecting a process for separating the good rock from the waste in mine refuse.

Arva Stroud, who has been connected with the New York office of the Allied Machinery Company of America, sailed Saturday, Jan. 22, for France. He will in the future be connected with the Paris office of the company.

Arthur L. Jennings has retired as president and general manager of the Russell-Jennings Mfg. Company, Chester, Conn. He has been succeeded as president by Stephen E. Jennings and Wilbur H. Brothwell has been made vice-president and general manager. Mr. Brothwell has been associated with the company for 33 years.

Samuel M. Stone, for some years sales manager, has been elected a vice-president of the Colt's Patent Fire Arms Mfg. Company, Hartford, Conn., and Harold D. Fairweather has been appointed assistant treasurer.

Joseph A. Holland, for nine years secretary of the Rhode Island branch of the National Metal Trades Association, has resigned to accept a position as supervisor of employment with the General Electric Company, Schenectady, N. Y.

At the recent annual meeting of the Warner & Swasey Company, Cleveland, Ohio, Leslie B. Stauffer was elected secretary to succeed Frank A. Scott, who has been secretary and treasurer. Mr. Scott was elected second vice-president and continues as treasurer. Mr. Stauffer has been associated with the company for many years, starting as a clerk in the factory.

L. S. Kerchner, who has been assistant to Stuart B. Marshall in the management of the Dunbar Furnace Company's properties at Dunbar, Pa., has been appointed to succeed Mr. Marshall, who has gone to Whitney, N. C., to take charge of the properties of the Aluminum Company of America and to build a model industrial town.

K. Hansen, W. Hesser Pavitt, Jr.. and R. C. Jensen have opened an office at 17 Battery Place, New York, under the name of Hansen, Pavitt & Jensen, consulting engineers for by-product coke ovens, benzol recovery plants, tar distillation, etc. Messrs. Hansen and Jensen were connected with the H. Koppers Company and the Otto Coking Company. Mr. Pavitt was with the American Coke & Gas Construction Company and its successors, the Schniewind Coke Oven Company and Otto Coking Company. All three have served a number of years under Louis Wilputte, the well-known coke-oven engineer.

A. W. Gregg, superintendent Bucyrus Company, South Milwaukee, Wis., was the principal speaker before the January round table of the safety and sanitation committee of the Milwaukee Merchants & Manufacturers' Association. He said that 99 per cent of foundry accidents are due to carelessness. To reduce accidents he suggested education of the workmen and foremen. The latter, he said, should be made to feel responsibility for those working under them.

Dr. Francis D. Patterson, a Philadelphia consulting safety expert, has been appointed chief of the division of industrial hygiene and engineering of the bureau of inspection in the Pennsylvania Department of Labor and Industry. He succeeds the late Dr. John C. Price, who died in October.

William R. Blair, formerly works manager of the Landis Machine Company, St. Louis, has accepted a corresponding position with the Measuregraph Company, Olive Street, St. Louis, maker of a yardage measuring instrument for stores and warehouses.

James C. Kelly, for many years with Berry Brothers, joined the selling staff of the Moller & Schumann Company, varnishes and enamels, Brooklyn, N. Y., Jan. 1. Frank J. Shay, also for many years with Berry Brothers in New England, is now representing the Moller & Schumann Company in Boston and eastern Massachusetts, with headquarters in Boston.

A. G. Schumann, vice-president Moller & Schumann Company, Brooklyn, N. Y., was elected president of the Travelers' Association of the paint and allied trades of New York City, Jan. 15.

W. Nelson Smith, for some thirteen years electrical engineer with Westinghouse, Church, Kerr & Co., and for the last two years practising consulting engineering, particularly in electric railroad work, has joined the American Agricultural Chemical Company as efficiency engineer with headquarters at 92 State Street, Boston. His work in the examination of plant operations will take him over the forty plants distributed around the country.

Walter B. Snow and staff, advertising agents and publicity engineers, Boston, Mass., have added to their organization Charles W. Burrage, formerly of the instructing staff of the Massachusetts Insitute of Technology, and associated with the F. W. Dodge Company in connection with the preparation of Sweet's Index.

U. Kouga, proprietor of the Osaka Iron Works of Osaka, Japan, which makes castings for Japanese locomotives and freight cars, is now in this country, of which he plans to make an extensive tour.

T. G. Smallwood, formerly in charge of the Birmingham office of the Chicago Pneumatic Tool Company, has been transferred to Cincinnati, Ohio, and will be district manager with headquarters in that city. His territory embraces Kentucky, Tennessee, Alabama, Mississippi, southern Ohio and Indiana. W. C. Walker has been appointed district manager of the auto truck department and will make his headquarters in Cincinnati.

E. Gybbon Spilsbury was elected president of the Engineers Club of New York on Jan. 25.

The National Screw & Tack Company, Cleveland, Ohio, at a meeting of its directors Jan. 20, declared a stock dividend of 16 2/3 per cent, which will be issued to the holders of common stock. The present capital stock is $1,500,000, which will be increased by the stock dividend to the full authorized issue of $1,750,000.

The Vanadium-Alloys Steel Company, Pittsburgh, with works at Latrobe, Pa., is installing an additional 30-pot crucible furnace. Although this company more than quadrupled its business in the past nine months, the demand for its products is so great that a plan for continuous enlargement appears necessary.

OBITUARY

MICHAEL J. DRUMMOND, prominent for many years in the cast-iron pipe trade, died Jan. 22 at his home in New York City, from pneumonia, aged 65 years. He was born in Jersey City and was graduated from Manhattan College, New York. As soon as he left college Mr. Drummond became an iron manufacturer and founded the firm of M. J. Drummond & Co. In 1910, on his appointment as Commissioner of Charities of New York City, he practically retired from the firm, turning the business over to his son, Walter J. Drummond, and from then on gave his principal attention to charity. During his tenure of office he was active in many reforms which resulted in bettering conditions in his department. He was always deeply interested in civic problems. At the time of his death he was connected with a number of corporations and business enterprises. He was chairman of the executive committee of the Emigrant Industrial Savings Bank, a director of the Broadway Trust Company, president of the Drummond Iron Works and of the Nassau County Water Company and the Shawmut Clay Mfg. Company, a director in the Green Island Water Supply Company, Jamaica Water Supply Company, and Glamorgan Pipe & Foundry Company, and treasurer of the Waxement Company, Inc. He leaves his widow, three sons and two daughters.

WILLIAM B. RUGGLES, a prominent engineer, and recently engineering adviser to the Russian Government, died Jan. 23, from pneumonia, at his home at Bergen Point, N. J., aged 55 years. He was the head of the Ruggles-Coles Engineering Company, 50 Church Street, New York, which he founded. He was born in Bath, N. Y., was graduated from Cornell, and shortly after engaged in his profession in this city. He was the inventor of an iron-ore dryer extensively used on the Mesaba range. He was president of the Novella Cement Company and a director of the Buffalo Potash & Cement Corporation. He was a member of the Engineers', Cornell, Phi Upsilon and New York Athletic clubs, and of the American Society of Mechanical Engineers. He leaves his widow and one daughter.

JOHN GEORGE, president Acme Foundry Company, Brooklyn, N. Y., died at his home in that city Dec. 20, from pleuro-pneumonia, after a short illness, aged 59 years. He was born in Scotland, but came to this country many years ago and settled originally in Hoboken, N. J. He removed to Brooklyn about 15 years ago and assisted in establishing the company of which he later became the head. He was identified with the iron business all his life and understood it thoroughly. He leaves a widow and a daughter.

FRANK R. LINDSLEY died suddenly at his home in Cincinnati, Ohio, Jan. 19, aged 57 years. He was correspondent at that point for the *American Metal Market*, but had at one time acted in the same capacity for THE IRON AGE and subsequently for the *Iron Trade Review*. He leaves his widow, a son and a daughter.

JAMES D. FARASEY, Cleveland, Ohio, for over 20 years secretary of the American Boiler Manufacturers' Association, died Jan. 25, following a surgical operation. He was proprietor of the H. E. Teachout Boiler Works, Cleveland, and had been prominently identified with the boiler industry in that city for more than 25 years.

HENRY HARPER SEIDEL, one of the owners of the Perry forge at Marysville, Pa., and a former owner of the Reilly charcoal forge at Lucknow, Pa., died at his home in Harrisburg, Pa., Jan. 17. He leaves his widow and five children.

PHILIP C. ELBERTI, who long ago was superintendent of the old Cameron furnace near Middletown, Pa., died Jan. 8 at his home in Harrisburg, Pa., aged 74 years.

WILLIAM T. DAY, for many years in the structural iron business in New York City, prior to his retirement, died at his home in Summit, N. J., Jan. 15, aged 83 years.

WILLIAM R. WITWORTH, president Witworth Hardware Company and treasurer Powers Foundry Company, Elkton, Md., died Jan. 21, from pneumonia, aged 56 years. He leaves his widow and two children.

CARL PECKITT, only son of Leonard Peckitt, president Empire Steel & Iron Company, died at his home at Catasauqua, Pa., Jan. 15, aged 25 years.

JOSEPH BYRNE, former president of the Byrne Foundry Company, St. Louis, Mo., died Jan. 13, aged 92 years. He leaves five daughters.

HECTOR MCLEAN, former secretary-treasurer of the Michigan Bolt & Nut Works, Detroit, Mich., died Jan. 14.

CHARLES SHIELDS, a pioneer foundryman and steel fabricator of Stockton, Cal., died Jan. 2, from pneumonia.

Twentieth Anniversary of New England Foundrymen's Association

The twentieth anniversary meeting of the New England Foundrymen's Association, held at Boston Wednesday evening, Jan. 12, was made a red-letter occasion by the tribute paid to Fred F. Stockwell of the Barbour-Stockwell Company, Cambridge, Mass., who has been the association's secretary from the beginning. President Corbin made the address in recognition of Mr. Stockwell's long service and his devotion to the interests of the association. In connection with the gift of a loving cup to Mr. Stockwell there was the presentation of a silver set to Mrs. Stockwell. The attendance was unusual, 156 being present at the banquet. This was followed by an evening of entertainment. The officers elected for the coming year are named below:

President, Stephen E. French, Athol Machine Company, Athol, Mass.

Vice-president, T. R. Scott, Brown & Sharpe Mfg. Company, Providence, R. I.

Treasurer, Geo. H. Gibby, Gibby Foundry Company, East Boston.

Secretary, Fred F. Stockwell, Barbour-Stockwell Company, Cambridge.

Executive Committee—Charles A. Reed, Reed, Fears & Miller, Boston; H. Paul Buckingham, Arcade Malleable Iron Company, Worcester, Mass.; L. J. Harley, Jr., Harley Company, Springfield, Mass.; Charles L. Taylor, Taylor & Fenn Company, Hartford, Conn.; Geo. P. Aborn, Blake & Knowles Steam Pump Company, East Cambridge.

American Sheet & Tin Plate Company Advances Wages

The American Sheet & Tin Plate Company has posted notices at sheet mills and tin-plate plants in the Central West that, effective Feb. 1, wages in tin mills will be advanced 6.4 per cent and in sheet mills 12.6 per cent, these advances restoring the reduction in wages made by the company in February last year. The advance affects all its mills except the sheet-mill plant at Gary, Ind., which operates under a separate scale, but wages at these works will be readjusted to a higher basis. These advances place the wages to be paid after Feb. 1 by the company to its tonnage men on a higher basis than the Amalgamated Association scale. Wages of common labor in all plants of the company have also been advanced 10 per cent, effective Feb. 1.

The National Oxhydric Company, 105 West Monroe Street, Chicago, has completed machinery and equipment for the installation of commercial plants for the sale of oxygen and hydrogen at Chicago, Pittsburgh, New York, Boston, Minneapolis, St. Louis, Kansas City, Detroit, Philadelphia and Los Angeles. Through these plants the company proposes to promote the use of equipment in the plants of large industrial works for the production of oxygen and hydrogen economically.

Machinery Markets and News of the Works

LARGE RUSSIAN INQUIRY

More Active Export Demand for Lathes

Some Manufacturers Are Anticipating Their 1917 Requirements of Machine Tools—Easier Freight Situation Helps Exports

The extent to which Russian interests desire to purchase in this country is indicated by the fact that one representative of a Petrograd house who is now staying in New York has a list of requirements embracing 3200 machine tools. The foreign department of a New York bank is inquiring for an indefinite number of 18-in. lathes, while from Canada there is an inquiry for 26-in. lathes. The domestic demand keeps up in a most satisfying manner despite the extent to which buyers are faced by the prospect of long deliveries.

The plant of the International Typesetting Machine Company, Brooklyn, N. Y., has been purchased by a reorganization committee, and a new company will be formed to carry on the business.

In the Middle West far-sighted manufacturers are particularly active in placing orders for tools which they will require to fill their 1917 contracts.

The shipyards of Arthur Sewall & Co., Bath, Me., have been leased for a term of years to the Texas Company, and the latter company will renovate the machine shops and install additional equipment.

The Titusville Forge Company, Titusville, Pa., is to make improvements at a cost of about $300,000. The Philadelphia Textile Machinery Company, Philadelphia, will build a plant, the main building of which will be 250 x 260 ft., also a power house, at a cost of about $200,000.

Cleveland notes that the falling off in demand for round lots of tools for ammunition work is enabling builders to give better attention to the active domestic demand, also that increased production is helping deliveries. The freight situation has improved, and export shipments are gradually going through to New York.

Presses and other equipment will be required by the Parish & Bingham Company, Cleveland, which will erect a plant to double its output of sheet-metal products.

The demand, both domestic and foreign, continues good for lathes in Cincinnati, and several newcomers in the field have done so well that they say they will continue to make lathes after the end of the war. The labor situation is improved for the present, but some fears are entertained as to what the spring may bring. Molders are on strike at two or three foundries.

Additions to the plant of the Recording & Computing Machine Company, Dayton, Ohio, comprise four buildings.

Milwaukee also regards it as fortunate that the war demand has become easier, in view of the better care that can be taken of domestic buyers in the industrial field.

The Allis-Chalmers Mfg. Company, Milwaukee, has awarded the contract for a new building, 84 x 540 ft.

On the Pacific coast, the requirements of the shipyards are the leading feature. They are so busy that the smaller shops are getting more than their usual quota of jobbing work. The Union Iron Works, San Francisco, has let the contract for a foundry to cost $100,000.

The Ross Rifle Company, Quebec, Canada, has awarded contracts for the making of rifle parts to a number of manufacturers who specialize in small parts.

The Peterborough Metal Products Company has taken over the plant formerly operated by the Canadian Cordage Company at Peterborough and will equip it for the manufacture of metal products.

New York

NEW YORK, Jan. 26, 1916.

Notwithstanding the extended deliveries a good healthy business is being done in machine tools, although in some instances it must be admitted that deliveries on some tools are so remote that manufacturers hesitate to place orders, especially in view of the fact that no definite price is named. Contracts usually specify, where the deliveries are very long, that the price paid shall be that prevailing at the time of delivery. Except for this clause none of the makers of standard tools have advanced their prices, and they are gratified that industrial users should buy in such a satisfactory way while quotations are on a war basis.

Information received from the West, particularly Detroit and Chicago, is that plant managers in those parts of the country appreciate the situation better than do most of those in the East. Many of them are buying machinery to be used on their 1917 contracts. Some of the Eastern sellers have lately devoted themselves to urging their customers to get their orders booked regardless of the far-off deliveries, pointing out that they may fare worse if they procrastinate. Interspersed with the demand from the domestic manufacturing field are occasional orders from domestic munitions makers.

The export inquiry is very largely Russian, while Canada intends to do some heavy purchasing also, facts which are emphasized by information which has just come to light. L. Neuschull, representing M. Mett & Co., Petrograd, Russia, who is staying at the Hotel Vanderbilt, New York, has a list of requirements which numbers no less than 3200 machines of various kinds. For many months he has been a purchaser in this and other markets.

Through its foreign department the National Bank of Commerce, New York, is inquiring for an indefinite number of 18-in. lathes for the manufacture of 3-in. shrapnel shells.

A representative of a Montreal interest has been inquiring for 26-in. lathes for making 8-in. shells, also for fuse-making equipment.

Groups of tools have been purchased by the Colt's Patent Fire Arms Mfg. Company, the Driggs-Seabury Ordnance Company and the Midvale Steel & Ordnance Company.

Henry B. Slossin, special master in the foreclosure suit against the International Typesetting Machine Company, Brooklyn, N. Y., sold that company's plant Jan. 25 to the reorganization committee for the sum of $1,650,000. The sale marks the first step in the launching of a new concern by the members of the reorganization committee. In December, 1914, the company was placed in the hands of Erskine Hewitt, 50 Church Street, New York, who heads the reorganization committee.

The Schoder & Lombard Engraving Company, 251 Canal Street, New York, which has been doing a business as manufacturer of steel stamps and dies, etc., for the past ten years, has incorporated the Schoder & Lombard Engineering Company with a capital stock of $10,000 to carry on this business. It will also manufacture machines for marking inscriptions, trademarks, etc., on metal and other products.

The Eagle Aero & Auto Company, Mt. Vernon, N. Y., has been incorporated with a capital stock of 150,000 to manufacture aeroplanes. E. C. Schleicher, 49 North Third

Avenue, Mt. Vernon; J. C. Schleicher, Times Building, and W. H. Waller, New York City, are the incorporators.

The Rockwood Mfg. Company, Rockwood, N. Y., has accepted plans prepared by Morrell Vrooman, engineer, Gloversville, N. Y., for a 1000-hp. water development.

The Oswegatchie Chemical Products Corporation, Gouverneur, N. Y., has been incorporated with a capital stock of $30,000 by F. H. Haile, J. H. Abbott and I. W. Burdick, Gouverneur, to manufacture chemical products from minerals.

George Howard, Inc., Mt. Vernon, N. Y., has been organized with a capital of $75,000 to manufacture hardware, etc. George Howard, A. F. Gescheidt and M. L. Hamilton, Mt. Vernon, are the incorporators.

The Defiance Paper Company, Niagara Falls, N. Y., is having plans prepared for additions to its paper mill at an estimated cost of $150,000.

The Will & Baumer Company, Syracuse, N. Y., manufacturer of beeswax, is having plans drawn for a manufacturing plant which it will erect on Liverpool Road and Spring Street, at an estimated cost of $300,000.

The Requa Electrical Supply Company, Inc., Rochester, N. Y., has been organized with a capital stock of $25,000 to manufacture electrical apparatus and appliances. W. A. Requa, 478 Arnett Boulevard, D. R. Cole and F. L. Greeno, Rochester, are the incorporators.

The International Alarm Company, Inc., has been organized with a capital stock of $100,000 to manufacture emergency signal devices. H. C. Marcellus and Otto Bitter, 39 St. Paul Street, are the incorporators.

The Atlas Steel Casting Company, Buffalo, will build a one-story steel and brick addition to its foundry at Elmwood Avenue and the Erie Railroad.

The Hooker Electro-Chemical Company, Niagara Falls, N. Y., has completed plans for an addition to its plant at Buffalo and Union streets and the New York Central Railroad.

The Coates Machine Tool Company, 30 Church Street, New York, which was incorporated some months ago with a capital stock of $10,000 and has since been doing a purchasing and shipping business for the Coates Machine Tool Company, Ltd., London, England, will probably establish a domestic and foreign machinery selling organization. Ernest H. Coates, London, England, is president; Porter Steele and Gordon W. Dowding, both of New York, are respectively vice-president and secretary.

The Borge Incinerator Corporation, Flatiron Building, New York City, incorporated some months ago with a capital stock of $10,000, is acting as consulting and contracting engineer for the erection of incinerator plants. John Borge is president, Mayer M. Swaab, Jr., vice-president and secretary, and C. J. Kelly is treasurer.

The Alaska Chemical Company, 44 Sherman Street, Jersey City, N. J., is having plans prepared by William T. Massarebe, 15 East Fortieth Street, New York, for rebuilding a six-story factory, 40 x 60 ft., at a cost of about $30,000.

The King Sewing Machine Company, Buffalo, is building an addition to its plant at Rano and Welland streets and the Lackawanna Railroad for a plating department.

Baltimore

BALTIMORE, MD., Jan. 24, 1916.

The plant formerly used by the Canton Iron & Steel Company has been purchased by the Baltimore Copper Smelting & Rolling Company, Canton, Md. Extensive improvements are to be made to the copper company's plant. It is stated that four additional buildings will be erected, two of which will be 78 x 477 ft., one story, and the other two 78 x 115 ft. Contract for the steel work has been awarded the McClintic-Marshall Company, Pittsburgh.

J. E. Aldred, of Aldred & Co., 24 Exchange Place, New York, is associated with financiers of Baltimore and New York in the establishment of a tin-plate plant to be erected near Baltimore. Details will not be available for about two weeks.

A six-story addition will be constructed by the Baltimore Cold Storage Company, 17-23 East Pratt Street, Baltimore, to cost about $40,000. Contract has been awarded Morrow Brothers, Fidelity Building.

The Baltimore Tube Company, Wicomico and Ostend streets, Baltimore, plans installing additional machinery to increase its output.

Contract for installing heating plants for two new shops of the Maryland Steel Company, Sparrows Point, Md., has been awarded the Enterprise Steam & Hot Water Heating Company, 600 North Howard Street, Baltimore. Three blower systems will be installed.

Equipment for the manufacture of automobiles is to be installed by the Barbour Buggy Company, South Boston, Va.

For the purpose of manufacturing a combination track sander and pipe cleaner for locomotives the White American Locomotive Sander Company, Roanoke, Va., has been organized.

The Wilmot Ventilating Company, Roanoke, Va., has been incorporated with $50,000 capital stock.

Plans are being prepared for a die shop for the Richmond Forgings Corporation, Richmond, Va., to cost about $8,000.

The Freed Heater Company, Collegeville, Pa., will establish a branch plant at Phoebus, Va., for the manufacture of stoves. Equipment will be installed at a cost of $15,000.

The Price Electric Devices Corporation, Waynesboro, Va., will establish a plant at Basic, Va., for the manufacture of lighting and ignition generators, starting motors and other automobile equipment. E. L. Eakle is general manager.

Philadelphia

PHILADELPHIA, PA., Jan. 24, 1916.

The Philadelphia Textile Machinery Company, Hancock and Somerset Streets, Philadelphia, Pa., maker of drying machinery, will start construction work on a plant to be erected at Sixth Street and Tabor Road within the next three weeks, from plans drawn by Day & Zimmerman about two years ago, which it will now use. Specifications include a main building of steel and concrete, one story, 250 x 260 ft., containing about 70,000 sq. ft. of floor space; a two-story office building, 33 x 112 ft., and a brick power plant, 35 x 42 ft., to cost in all about $200,000. Walter M. Schwartz is vice-president.

The Pennsylvania Taximeter Company, 329 South Broad Street, Philadelphia, will erect a ten-story garage with a frontage of 89 ft. on Broad Street and a depth of 150 ft. running through to Watts Street. It will be of reinforced concrete and steel.

The L. H. Gilmer Company, manufacturer of belting, etc., Tacony, Philadelphia, has completed the first unit of its new plant and has removed its office and manufacturing department into it. Arrangements are being made to break ground at once for a second unit, 50 x 200 ft.

The Hale & Kilburn Company, furniture manufacturer, Eighteenth Street and Lehigh Avenue, Philadelphia, with branches in all parts of the world, will close its furniture business to take up the manufacture of steel products, including metal auto bodies, car seats, metal office equipment and gas stoves. This line has in recent years overshadowed the famous furniture business of the firm. The store at 1315 Walnut Street will be closed when the last of the present stock of furniture has been disposed of at the auction now in progress. The company is planning to build an addition to its plant, covering a city block. James A. Bower was recently elected president. Its branch offices in all parts of the world will be maintained.

The American Machine Company, manufacturer of Hot-air pumping engines and tag machines, announces the purchase of its entire capital stock, factory and equipment by the Titan Motor Car Company. The business will be continued as a department in connection with the production of the Titan steam motor cars, under the original name; a full line of repair parts as well as completed engines will be kept in stock at all times for immediate shipment. The officers of the Titan Company are: R. R. Whittingham, president; G. H. Whittingham, vice-president, and W. H. Whittingham, secretary-treasurer.

The Mauch Chunk Iron Works, Mauch Chunk, Pa., which was burned down several days ago, it is said, will be rebuilt and operated on a larger scale than before.

Rapid progress is being made on the great plant of the Eddystone Munitions Company, Eddystone, Pa., in this borough, and the employment office is now hiring many skilled mechanics and listing hundreds of names of applicants, so they can be readily called in when their services are required.

The Traylor Motor Garage Company, Allentown, Pa., has been incorporated with a capital stock of $25,000 by Samuel W. Traylor, Bruce W. Traylor and Harry Battersby to repair motor vehicles and operate a garage.

The Nice Ball Bearings Company, Philadelphia, has been incorporated with a capital stock of $250,000 by Budd G. and S. W. Nice, Ogonts, Pa.; Frank Beemer, 1146 North Sixty-third Street, Philadelphia, and George Hoppes, 6105 Lansdowne Avenue, Philadelphia, to manufacture anti-friction bearings.

The Abradant Products Company, Philadelphia, with a capital stock of $15,000, has been incorporated by William

D. Sherky, 1421 Diamond Street; Henry B. Nicholas, 4943 Catherine Street, and William B. Goodall, Narberth, Pa., to manufacture abrasive wheels, tools, etc.

The Vinoppier Specialty Company, Wilkes-Barre, with a capital stock of $10,000, has been incorporated by B. C. Vincent, Kingston, Pa.; M. A. Oppenheim and L. S. Pierson, Wilkes-Barre, Pa., to manufacture metallic vaporizers for gasoline motors.

The American Music Roll Company, Chester, Pa., with a capital stock of $50,000, has been incorporated by Andrew A. Freeney, and others, to manufacture music rolls, music-roll machinery and musical instruments.

The Perkins Glue Company, Lansdale, Pa., manufacturer of vegetable glue, has leased a factory in Hamilton, Ont. Machinery is being installed and operations will commence about Feb. 15. C. J. B. Perkins is in charge.

The Cave Water Power Company, Cave, Penn., has been organized with $5,000 capital stock by J. H. Taylor, P. S. Walker, and others.

New England

BOSTON, MASS., Jan. 24, 1916.

The efforts of the New York, New Haven & Hartford Railroad and the earnest co-operation of consignees have had a good effect on the freight blockade in Connecticut. The other New England roads have been able to change their embargo orders so that the prospect of the rest of this section being seriously affected is apparently lessened. The New Haven road has been able to-day to issue orders accepting freight from some connecting lines, and reports from the points of worst congestion show that freight is moving more freely. On Jan. 15 there were 12,739 cars on the New Haven and Central New England railroads waiting unloading and 3407 waiting loading, or 32 per cent of all the cars on the two roads. On the same date there were 50,401 cars in all on the two roads. The officials consider 45,000 cars the roads' capacity. The Winchester Repeating Arms Company is meeting the situation by establishing a ferry between New Haven and Port Jefferson, Long Island. In Waterbury on Jan. 18, there were 900 cars consigned to private sidings alone. During the past week, the railroad company has handled about 3500 freight cars at this one station.

The Springfield Body Corporation is to be formed in New York to take over the business of the recently incorporated Springfield Body Company, Springfield, Mass. The old corporation was capitalized at $1,000,000 and the new corporation is to have capital of $2,500,000. Renskerf, Lyon & Co., New York City, who are acting as bankers of the new corporation, have announced that the Springfield plant will be continued and a new plant erected at Detroit, Mich. The two plants will be able to turn out 60,000 bodies each year. Walter L. Fry will be president and E. W. McGookin is to be vice-president and sales manager. The directorate will be composed of automobile men.

The Thomas H. Hart Company, Boston, Mass., has been incorporated with authorized capital of $90,000 by Thomas H. Hart and Edward W. Rogers, to make machinery.

The Novak Acetylene Apparatus Mfg. Company, Cambridge, Mass., has been incorporated with capital of $25,000 by Edward E. McGauty, Edward T. Ryan, and others.

The American Graphophone Company, Bridgeport, Conn., has taken out a permit to build a six-story addition to a concrete building on Railroad Avenue.

The Standard Smelting Company, Boston, Mass., has been incorporated with authorized capital of $25,000 by George M. J. Bates, William B. Nash and Edward E. Dunbar.

The R. H. Brown Company, Chester, Conn., which started a few weeks ago to manufacture reed chucks, expansion bits and screw drivers in the old Jennings factory, has removed its machinery to New Haven, owing to a failure of the plans for the reorganization of the company.

The purchase of the Windsor Machine Company, Windsor, Vt., by the National-Acme Mfg. Company, Cleveland, Ohio, was ratified by the stockholders of the latter company at a meeting in Cleveland, Jan. 20. The purchase price is stated to have been $3,575,000 or $1,100 a share.

The Remington Arms-Union Metallic Cartridge Company, Bridgeport, Conn., has filed a certificate of incorporation showing that stock has been issued to the amount of $50,000,000. All but 60 shares are held by Marcellus Hartley Dodge of New York City and Passaic Township, N. J. The remaining shares are held as follows: James L. Banks, Jr., Reginald Roome and Chauncey B. Garver of New York; George Bingham of Brooklyn, and Henry Hofman of West Hoboken, N. J., 10 shares each; Frederick N. Jackson of New York and C. L. Reierson of Bronxville, N. Y., 5 shares each. Officers have been elected as follows: Marcellus Hartley Dodge, president; Samuel F. Pryor, first vice-president; George Bingham, secretary and treasurer; C. W. Many and William H. Nolan, assistant treasurers. In addition to the manufacture of military weapons and ammunition, the company is authorized to manufacture automobiles and bicycles.

The Ashmusen Mfg. Company has removed from New York to Providence, R. I., where it has engaged factory space at 266 Pearl Street for the manufacture of aeroplane motors. H. W. Ashmusen is president.

The C. H. Cowdrey Company, Fitchburg, Mass., maker of special machinery, is adding 50 x 84 ft., two stories, to its machine shop.

Work has been started on the new plant of the Rockwell-Drake Ball Bearing Company, Plainville, Conn.

The Precision Gauge & Tool Company, 135 Cannon Street, Bridgeport, Conn., has been formed to manufacture gauges and small tools. The officers are: G. O. Gabriel, president and treasurer; Rolland E. Norton, manager; Harold DeW. Hotchkiss, secretary. The company expects to begin business Feb. 1.

The shipyards of Arthur Sewall & Co., Bath, Me., have been leased for five years by the Texas Company. The yards have been idle for ten years and the work of putting the machine shops in shape will be begun at once. Additional equipment will be installed.

The shipyard of Robert Palmer & Co., Noank, Conn., has been purchased by a firm of New York brokers for clients whose names have not been announced.

Confidence has been expressed that the strike of laborers at the foundries of the H. B. Smith Company, Westfield, Mass., will be settled this week. A conference has been arranged for Tuesday, Jan. 25.

The strike of 220 employees of the Crescent Fire Arms Company, Norwich, Conn., has been settled by the granting of an increase in wages.

The Adams & Smith Company, Hartford, Conn., has been incorporated with authorized capital of $50,000, of which $15,000 has been paid in, to manufacture machinery, gun parts, and tools, jigs and fixtures. No factory has yet been secured. The incorporators are Daniel M. Wright, Ernest F. Oakley and Frederick M. Smith.

The Whitney Mfg. Company, Hartford, Conn., has bought land and buildings on Elizabeth Street. No further building is contemplated.

Chicago

CHICAGO, ILL., Jan. 24, 1916.

The Kofaro Steel Works, 4030 North Rockwell Street, Chicago, will shortly be in the market for heat-treating furnaces, annealing ovens, tempering tanks and other equipment. It has yet to erect its plant, and will shortly place a contract for the building.

The Morava Construction Company, Eighty-fifth Street and Stewart Avenue, Chicago, has purchased property adjoining its plant, 345 x 495 ft., to be used for an extension.

F. A. Bennett, 5844 Broadway, Chicago, is preparing to erect a sheet-metal shop, two stories, to cost $6,000.

The Charles Stecher Company, Chicago, builder of automatic machinery, has purchased a two-story building, 75 x 220 ft., at 1574 Crossing Street. The company has recently taken considerable orders for machine tools, a large part of which are drill presses, and the larger capacity has been necessary to accommodate this business.

The Smith Form-A Truck Company, Chicago, has acquired a site, 200 x 662 ft., at Fifty-sixth Street and Fifty-eighth Avenue, Clearing, upon which a plant will be erected at once. The first unit will be 176 x 362 ft.

The Louden Machinery Company, Fairfield, Iowa, has purchased property and will erect a two-story brick factory.

The American Can Company is expending about $60,000 in doubling the capacity of its plant at Hoopeston, Ill.

The Boss Mfg. Company, Sioux City, Iowa, has leased additional factory space which it hopes to have equipped for operation May 1.

The Des Moines Steel Company, Des Moines, Iowa, has been incorporated with a capital of $10,000 to engage in bridge work and general fabricating. The incorporators are J. E. Van Liew and John L. Gillespie.

The Rock Island Plow Company, Rock Island, Ill., has acquired the plant and business of the Heider Plow Company, Carroll, Iowa, and is moving the equipment of the latter plant

to Rock Island where the manufacture of the Heider tractor will be continued.

The Stearns-Roger Mfg. Company, 1718 California Street, Denver, Col., is adding equipment, including boiler shop and machine shop tools, to be served with a 15-ton electric crane awarded to the Pawling & Harnischfeger Company, Milwaukee. The purchase of other equipment is to be delayed until early spring.

Detroit

DETROIT, MICH., Jan. 24, 1916.

The Union Steam Pump Company, Battle Creek, Mich., has increased its capital stock from $600,000 to $1,000,000 and will purchase machinery sufficient to increase its output from 25 to 30 per cent. The company will manufacture pumps for various kinds of motive power.

The Gier Pressed Steel Company, to whom reference has been previously made under the name Gier & Dail Mfg. Company, Lansing, Mich., which company it succeeds, has a fully paid capital of $500,000. The company, in addition to the regular stamping business in which it is now engaged, will manufacture one-piece shrouds and panels for automobile bodies, fenders, radiator covers and oil pans. Additional equipment is contemplated. B. S. Gier is secretary and general manager.

The Long Mfg. Company, Detroit, manufacturer of automobile radiators, is planning to increase its facilities by the erection of additional stories which will double the capacity of the plant.

The Signal Motor Truck Company, Detroit, has increased its capital stock to $450,000 by the incorporation of a new company under Maine laws to take over the present organization. The purpose of the increase in capital is to provide for extensions of its manufacturing facilities.

The L. Bregand Mfg. Company, Detroit, has been incorporated with $8,000 capital stock to manufacture automobile parts and accessories. The incorporators are R. J. L. Duquet, George G. Bonthinon and Sid A. Erwin.

The Standard Motor Truck Company, Detroit, will enlarge its plant by the erection of a three-story addition about 125 x 150 ft.

The Detroit Engineering Products Company, Detroit, has been organized with a capital stock of $60,000 to manufacture automobile parts. The incorporators are Earle Wieborn, Raymond K. Dykema and Clifton G. Dyer.

The Liberty Motor Car Company, Detroit, has been incorporated with $400,000 capital stock to manufacture automobiles. George B. Allen is a stockholder.

The C. M. Hall Lamp Company, Detroit, manufacturer of automobile lamps, has increased its capital stock from $150,000 to $300,000. An addition to its factory is in course of erection.

The English & Miller Machinery Company, Detroit, has increased its capital stock from $5,000 to $25,000.

The Original Gas Engine Company, Lansing, Mich., has increased its capital stock from $150,000 to $300,000, and changed its name to the Ideal Engine Company.

The G. T. Eames Company, Kalamazoo, Mich., has been incorporated with $10,000 capital stock to take over the business of Gardner T. Eames, manufacturer of mechanical devices. It plans the erection of a foundry, 80 x 150 ft., to manufacture its own castings.

Indianapolis

INDIANAPOLIS, IND., Jan. 24, 1916.

The American Warming & Ventilating Company, Indianapolis, Ind., has filed preliminary articles of dissolution.

The Hill Tripp Pump Company and the Hill Machine Company, both of Anderson, Ind., have filed preliminary certificates of dissolution.

The Indiana Panel & Veneer Company, New Albany, Ind., has begun the erection of an addition to its plant, to cost $50,000. It has sold its output for the next six months.

The Bockstege Furniture Company, Evansville, Ind., will make an addition to its plant, to cost $40,000.

Dore Ogden, owner of an automobile parts factory at Columbus, Ind., will move it to Plymouth, Ind.

The I. R. Redinger Company, Logansport, Ind., has been incorporated with $5,000 capital stock to manufacture electric batteries, etc. The directors are Ivan R. Redinger, H. I. Redinger and Mark W. Heath.

The Sullivan County Electric Company, Clinton, Ind., has increased its capital stock from $60,000 to $150,000. It plans to supply light, heat and power to neighboring cities and towns.

The Hebron Light, Heat & Power Company, Hebron, Ind., has increased its capital stock from $25,000 to $100,000.

The Hercules Tractor Company, Evansville, Ind., has been incorporated with $300,000 capital stock to manufacture tractors and other farm machinery. The directors are William H. McCurdy, John D. Craft and Lynn H. McCurdy.

The stone plant of the J. Hoadley & Sons Company, at Stinesville, Ind., burned Jan. 20, with the loss of $105,000.

The Pittsburgh Model Gas Engine Company, Peru, Ind., has received an order from the Baldwin Locomotive Works for engines, amounting to $175,000.

The Portland Body Works Company, Portland, Ind., is building an addition to its plant, 64 x 48 ft., two stories, to take care of recent growth in business.

The Mishawaka Machine Company, Mishawaka, Ind., has just completed an addition to its plant in which it will install considerable new machinery.

Milwaukee

MILWAUKEE, WIS., Jan. 24, 1916.

Reports of plant extension and new construction increase. It is considered fortunate that the export demand for machine tools has slackened, for the domestic requirements are running into a large volume which must be met sooner than expected. Not all tools purchased for exportation have been delivered as yet, making it difficult to give domestic buyers any kind of a guarantee on delivery. A large number of garages with small machine shops in connection are being erected throughout Wisconsin. The shortage of raw materials is beginning to have its effect, particularly in the automobile engine industry and one or two makers are reported to have been obliged to reduce extra shifts on that account.

The French Battery & Carbon Company, Madison, Wis., has awarded the general contract for the construction of its new factory, containing 45,000 sq. ft., to the Worden-Allen Company, Milwaukee and Chicago. The factory will be of fireproof construction, 175 x 225 ft., one story. J. B. Ramsey is general manager.

Klug & Smith, engineers, Mack Block, Milwaukee, have been awarded the general contract for a new receiving building for the Allis-Chalmers Mfg. Company, Milwaukee, at the main works in West Allis. The contract for the steel work has been sublet to the Federal Bridge Company, Waukesha, Wis. The building will be one, two and three stories, 84 x 540 ft., of brick, steel and mill construction, equipped with one 20-ton electric traveling crane.

The Cream City Boiler Company, Thirty-seventh Avenue and Lapham Street, Milwaukee, has amended its articles to provide for an increase in the capital stock from $35,000 to $50,000. The additional issue will be used both for accommodating the surplus and increasing the capacity.

Articles of incorporation have been filed by the Magnetic Mfg. Company, Milwaukee. The capital stock is $15,000 and incorporators include Alvin Dings, F. Terry Andrae and Bernhard Kubitz. Mr. Dings is general manager of the International Electric Tool Company, 764 Windlake Avenue, Milwaukee.

The board of public works, Manitowoc, Wis., will take sealed bids until Jan. 31 for furnishing two 300-hp. water-tube boilers with appurtenances. Alternate bids for three boilers will also be received. John J. Kelly is city clerk.

The Raulf Company, 53 Patton Building, Milwaukee, general contractor on the new electric steel foundry for the Electric Steel Castings Company, Milwaukee, is taking sub-bids. Equipment for the first unit includes two 3-ton wall cranes; two 10-ton traveling cranes for the yard, and one 10-ton inside crane. Leo G. Smith, 725 Superior Street, is president and general manager.

The Advance Engineering Company, Thirtieth Street and North Avenue, Milwaukee, has contracted with the Pawling & Harnischfeger Company, Milwaukee, for one 5-ton electric traveling crane for its works now being completed.

The firm of Dunham & Cram, machine shop, Whitewater, Wis., has been dissolved. Daniel Cram retires. J. R. Dunham has formed a new partnership with Ralph M. Fiske, and will continue the business under the style of Dunham & Fiske.

The Fitzsimmons Steel Products Company, Milwaukee, has let the steel work on its new plant, Park Street, between Fifth and Sixth avenues, to the Northwestern Bridge & Iron Company, 127 South Water Street, Milwaukee.

E. W. Scheel, Turtle Lake, Wis., is preparing to build a garage and machine shop, 50 x 124 ft., for the Turtle Lake Auto Company.

Leenhouts & Guthrie, architects, 424 Jefferson Street, Milwaukee, are preparing plans for a chair factory as another unit of the new Milwaukee county house of correction, to cost

$800,000 complete. The work will be undertaken in the spring. Louis G. Widule is county clerk.

Paul Pirwitz, Marshfield, Wis., will build a garage and machine shop, 48 x 88 ft., at Fourth and Maple streets.

The Wisconsin Aluminum Foundry Company, Manitowoc, Wis., is contemplating the erection of a foundry addition, 60 x 140 ft., at Sixteenth and Franklin streets. Bruno Dalwig is general manager.

The Western Steel & Iron Company, DePere, Wis., has awarded the general contract for a two-story brick addition to its machine shop to A. J. Beauregard, DePere.

E. F. Krueger will build a new garage and machine shop at Glenwood City, Wis.

A garage and repair shop is about to be established at Glenwood City, Wis., by James F. Salmon.

The Standard Garage Company, Racine, Wis., has been incorporated with a capital stock of $20,000 by A. J. Jonas, Joseph Havlish, Joseph Prostrednik and Alfred Larson, to operate a garage and machine shop.

Cincinnati

CINCINNATI, OHIO, Jan. 24, 1916.

A good demand exists for lathes and other machine tools, both from domestic and foreign makers of war munitions, but no large sales have been closed lately, owing to the difficulty of getting prompt deliveries. Several manufacturers in this section who formerly turned out other equipment are now engaged in building lathes. Many of these state that they will continue this line after the war demand is over, and even now there is considerable speculation as to the ultimate effect on this branch of the machine-tool trade.

The demand for portable electric tools is better than it has been in about three years. Both domestic and export orders are satisfactory. The boiler and tank business is unchanged, but a general feeling of optimism prevails. The foundries in this section, with the exception of those in Hamilton, Ohio, are operating at about 75 per cent of capacity.

The local labor situation continues to improve, and at Hamilton conditions in the machine shops are nearly normal. One large company reports 88 per cent of its men at work. The molders, however, are still out at two or three foundries, which are operating with reduced forces.

The Cincinnati Gear Company, Cincinnati, will build a one-story reinforced concrete addition to its plant on Reading Road. Little equipment, outside of the company's own manufacture, will be needed.

The National Lead Company, Cincinnati, has taken out a permit for an addition to its plant on Freeman Avenue, estimated to cost $35,000. Only special equipment will be required.

The Nydia Lock Company, Cincinnati, has been incorporated with $50,000 capital stock by E. M. Benham, and others, to manufacture a patented door and file cabinet lock. It has leased quarters in the Lion Building and is buying machinery.

The Anchor Mfg. Company, Dayton, Ohio, has been incorporated with $10,000 capital stock by Carl Brough, J. E. Wells, and others, to manufacture rubber specialties.

The additions to the plant of the Recording & Computing Machines Company, Dayton, Ohio, will comprise four brick buildings, approximately 30 x 36 ft., one story. The contract has already been given out.

The American Mechanical Toy Company, Dayton, Ohio, has been incorporated with $150,000 capital stock by F. A. Wagner, and others, and will operate a factory.

The Dayton Time Lock Company, Dayton, Ohio, is contemplating an addition to its plant. Details are not yet available.

The Springfield Safety Emery Wheel Company, Springfield, Ohio, has let contract for a two-story brick office building to be erected adjoining its plant.

The Excelsior Seat Company, Columbus, Ohio, will install machinery for the manufacture of automobile bodies.

The Crystal Ice Company, Columbus, Ohio, contemplates making an addition to its plant, for which ice-making equipment will be required.

The Lamneck Company, Columbus, Ohio, manufacturer of heating equipment, will soon commence work on a three-story brick addition.

The Reliable Engine Company, Portsmouth, Ohio, has placed an order for additional machinery to be installed in its plant. Further extensions are planned.

The Moser Pattern & Foundry Company, Marietta, Ohio, has leased its gray iron foundry to the C. W. Cunningham Foundry & Furnace Company, a new company formed to operate separately this department.

The National Automatic Tool Company, Richmond, Ind., is having plans prepared for an addition to its plant.

Cleveland

CLEVELAND, OHIO, Jan. 24, 1916.

New demand for machine tools continues active, coming largely from companies making plant extensions. One inquiry from this source is for about 30 machines and another for about 40 standard tools. With about all metal-working shops crowded to capacity, many manufacturers are planning the erection of additions. The demand for turret lathes is holding up well. With the falling off of round lot sales for ammunition work and the increased production capacity, better deliveries can be made than for several months. Second-hand machinery is moving rather slowly owing to the high prices asked. The freight situation has improved somewhat; and manufacturers now have less trouble getting shipments through to New York for export than they had a few weeks ago.

The Parish & Bingham Company, Cleveland, which erected a sheet-metal stamping plant about a year ago, finds it inadequate for its growing business and will shortly place contracts for additions to double the present capacity. A duplicate of the main building, of brick and steel, will be erected. An addition will also be made to the boiler plant and one new boiler installed. Presses and other equipment will be required. Plans are being prepared by Ernest McGeorge, Leader-News Building, Cleveland, Ohio.

The Champion Machine & Forging Company, Cleveland, will shortly place contracts for an extension to its forge shop and will install four additional hammers. It has about completed a new building, 50 x 150 ft., the lower floor of which will be used for a die shop.

The Chandler Motor Car Company, Cleveland, has placed a contract for the erection of a one-story repair shop, 60 x 160 ft. Two more stories will be added later.

The F. A. Maxwell Machine Company, Cleveland, has been incorporated with a capital stock of $25,000 to manufacture special machinery and engage in general machine shop work. It will continue the business formerly conducted by F. A. Maxwell, at 411 Frankfort Avenue, the incorporation being for enlargement. The controlling interest is retained by Mr. Maxwell.

S. K. Elliott, Cleveland, has acquired a four-story and basement building in Ravenna, Ohio, to manufacture rubber specialties.

The Safety Service & Engineering Company, Cleveland, has been incorporated with a capital stock of $10,000 to conduct a general safety and engineering business. Oscar MacNab and others are interested.

The Perfection Automatic Machine Company, Cleveland, has been incorporated with a capital stock of $10,000 by Paul P. Tirohne, Harry M. Long and others.

The W. H. Mullins Company, Salem, Ohio, will enlarge its plant by the erection of a three-story brick and steel addition, 150 x 200 ft. This will provide greater capacity for the manufacture of automobile parts, and will also contain an assembly hall, kitchen, dining room and emergency hospital.

The Toledo Steel Wrench & Tool Company, Toledo, Ohio, has been incorporated with a capital stock of $75,000 by John W. Rabb, C. D. Wilson, Charles J. Alwood and others, to manufacture wrenches and tools.

The Keasey Mfg. Company, Fostoria, Ohio, will increase its capital stock from $25,000 to $50,000 in order to enlarge its plant and add hangers and shafting to its present product of wooden pulleys.

The Sunray Stove Company, Delaware, Ohio, has purchased a site and will erect a factory which will largely increase its output.

The LaBelle Box Company, Martins Ferry, Ohio, will erect a plant 80 x 176 ft. to replace the one burned recently.

The Tubeless Tire & Rubber Company, Millersburg, Ohio, with a capital stock of $75,000, will establish a plant for the manufacture of automobile tires in a building now occupied by the Helmuth Slate & Steel Company. W. R. Price is president and G. J. Jordan, secretary and treasurer.

The John Mertz Mfg. Company, Sandusky, Ohio, maker of gasoline tanks and other sheet-metal products, will shortly begin the erection of a plant which will more than double its present capacity.

The E. V. Sala Company, Toledo, Ohio, has been incorporated with a capital stock of $15,000 by W. H. Scott, Edward G. Kirby ,Earl V. Sala and others, to manufacture a sleeve gasoline motor.

Birmingham

BIRMINGHAM, ALA., Jan. 24, 1916.

Outside of an insistent demand for machine tools, which it is difficult to fill on time, the machinery trade reports a lull in business. Small factory construction continues to be the leading feature throughout the South Atlantic and Gulf states.

The Alabama Company will reopen its ore mines near Gadsden and install machinery.

The Texas Oil Company, Birmingham, has secured a site and will rebuild its burned plant.

The Alabama Chemical Company, Montgomery, has been organized with a capital stock of $250,000 by F. C. Battey, John H. Hurter, D. C. Allen, and others.

The King Stove & Range Company, Sheffield, Ala., has been organized by W. H. Palmer and others to manufacture stoves.

S. H. Henderson, and others, Talladega, propose to establish a packing plant.

A company has been organized at Tampa, Fla., with $100,000 capital stock to establish a packing plant and a cold storage warehouse, to cost $25,000. Joseph Mizell, Arcadia, Fla., heads the enterprise.

The Central Lumber Company, Kissimee, Fla., has been incorporated by Sam G. Ragsdale, and others, with a capital stock of $100,000.

The American Agricultural Fertilizer & Chemical Company, Greensboro, N. C., proposes to build a large fertilizer factory.

The Shale Paving Brick & Fireproofing Company, Pine Hill, N. C., with a capital stock of $100,000, has been organized by C. M. Thomas, James J. Wall, and others. It has acquired the Dan River Brick Company's plant, which it will remodel to have capacity of 50,000 brick.

W. A. Carver, Rougemont, N. C., is in the market for a 25-hp. oil engine.

Woodland, Ga., is in the market for a 20-hp. oil or gasoline engine for a small electric light plant.

The Central South

LOUISVILLE, KY., Jan. 24, 1916.

The demand for boilers has been unusually heavy the past week or two, manufacturers reporting that their chief difficulty is not getting business, but getting material. Several large power-generating projects have developed in this section of late, and electrical as well as steam equipment manufacturers find conditions satisfactory. Most lines of special equipment are selling well, but there is no outstanding feature of this department.

The Louisville Gas & Electric Company will erect a power plant at First and Washington streets at a cost of $1,000,000, which will increase its capacity from 22,000 to 37,000 kw. A 250-ft. smokestack will be built in connection. The equipment, some of which has been purchased, will be bought through the offices of H. M. Byllesby & Co., Chicago.

The Jeffersonville high school, Jeffersonville, Ind., is planning to equip a manual training department.

The White Star Coal Company, Pineville, Ky., is in the market for an electric hoist.

The Tower Mfg. Company, Madison, Ind., manufacturer of carpet tacks, is in the market for additional machinery. John C. Finch is superintendent.

The Redicker Machine Company, Owensboro, Ky., has been organized with $50,000 capital stock and will establish a factory to manufacture gasoline engines. Charles Redicker is president, H. T. Quick, secretary, and F. J. Laswell, treasurer.

T. W. Minton & Son, Barbourville, Ky., manufacturers of wagon and automobile parts and golf sticks, will enlarge their plant. A department to make handles and mining supplies will be equipped.

The American Chemical & By-products Company, organized with a Delaware charter, will establish a plant for the manufacture of chemicals. Ben D. Williams, Frankfort, Ky., is one of those interested. The company has $3,750,000 capital stock.

The Glasgow Flooring Company, Glasgow, Ky., has purchased the plant of the New Glasgow Planing Mill Company and will equip it to manufacture hardwood flooring.

The Danville Light, Power & Traction Company, Danville, Ky., will install oil-burning engines and displace its present coal-burning equipment.

The Crescent Light Company, Taylorsville, Ky., has announced that the capacity of the electric light plant will be doubled.

The Kingsport Pulp Corporation, Kingsport, Tenn., has been organized with $650,000 capital stock to manufacture wallboard. The plant will be operated in connection with that of the Kingsport Extract Company.

Announcement has been made that the Federal Dyestuff & Chemical Company, Kingsport, Tenn., will build a steam-driven electric power plant to be equipped with turbines, alternating-current generators, rotary convertors, mechanical stokers, etc. The cost of the plant, the contract for the design and construction of which has been let to the Southwestern Engineering Company, Bristol, Tenn., will be $100,000.

The Clinchfield Portland Cement Corporation, Kingsport, Tenn., has announced plans for an electric power distributing station with a capacity of 10,000 kw. The present power plant will be greatly enlarged, and the work will be completed within six months. L. L. Griffiths, general superintendent, has details.

The Boaz Emergency Manufacturing Company, Chattanooga, Tenn., will build a foundry and general metal-working plant comprising three buildings. The company is now located at Hamilton, Ohio.

William H. Bostwick, Jefferson City, Tenn., will equip a garage at Morristown, Tenn. A hand-operated elevator is needed.

The Illinois Central Railroad, with general offices at Chicago, will equip a machine shop and roundhouse at Dyersburg, Tenn.

The Mascot Stove & Range Company, Chattanooga, Tenn., which recently moved its plant from Dalton, Ga., expects to make further enlargements.

The W. J. Oliver Mfg. Company, Knoxville, Tenn., has announced that equipment for the manufacture of shells for the Italian Government has been installed.

St. Louis

ST. LOUIS, MO., Jan. 24, 1916.

The machine-tool market still shows a plenitude of business and a scarcity of supplies. The increasing disposition of the investing public to utilize its funds in new enterprises is adding to the pressure for equipment; but delivery difficulties postpone the starting of many new establishments. Second-hand tools continue to be snapped up as eagerly as ever, and dealers spend much of the time of their men in hunting for equipment that may be reconstructed or otherwise made suitable for use. Collections are very good and money rates at the banks continue low.

The United States Aniline & Chemical Company, St. Louis, Mo., has been incorporated with a capital stock of $50,000 by J. D. Layne, W. F. Haley, 1108 Ste. Ange Avenue, and S. P. Keyes, to manufacture dyes.

The St. Louis Sectional Garage Company, St. Louis, Mo., has been incorporated with a capital stock of $15,000 by Eugene H. Angert, Franklin H. Sullivan and Edward W. Lake and will equip to manufacture portable metal garages.

The All-Steel Motor Car Company, LaSalle Building, St. Louis, Mo., will equip its factory at Macon, Mo., for operation by early fall and in the meantime will assemble cars in St. Louis.

The United States Incandescent Lamp Company, 2901 Clark Avenue, St. Louis, Mo., will erect an addition to its plant at once.

The Booth-St. Louis Fisheries Company, St. Louis, has decided to build a 12-story addition to its recently acquired cold-storage plant and also build a powerhouse.

The Wagner Electric Company, Plymouth Avenue and the Wabash Railroad, St. Louis, Mo., will construct an addition to its plant to cost $55,000.

The Fuller Process Company, Kansas City, Mo., has been incorporated with a capital stock of $10,000 by Claud E. Fuller, C. S. Monroe, and R. C. Penfield to apply special durability treatment to bricks and clay tile.

The Home Electric Company, New Franklin, Mo., has been incorporated with a capital stock of $10,000 by J. H. Keist, W. W. Carpenter and R. J. Carpenter to operate an electric light and power plant.

The O. & L. Auto Supply Company, Kansas City, Mo., has been incorporated with a capital stock of $14,000 by W. C. Berry, F. M. Ostertag and N. E. Lugo.

The Gibson Motor Car Company, Webster Groves, Mo., has been incorporated with a capital stock of $15,000 by John D. Gibson, Jr., S. H. Wallace and Fred Johnson.

The McDowell Motor Car Company, Kansas City, Mo., has been incorporated with a capital stock of $13,000 by W. P. McDowell, Frank J. Hall and R. L. Stancliff.

Kansas City, Mo., has sold $50,000 of bonds, the proceeds to be devoted to new electric equipment.

The De Soto Dairy, Ice & Supply Company, De Soto, Mo., will equip a 30-ton ice plant and also an ice cream factory at Festus, Mo.

The King Mogul Motor Company, Tulsa, Okla., has been incorporated with a capital stock of $10,000 by C. H. Hubbard, C. A. Campbell and Philip Kates, and will establish a machine shop and repair plant.

W. B. Craig, 550 Walnut Street, Kansas City, Mo., is receiving bids on equipment for freezing an indoor ice-skating rink which will cost $75,000.

The Wheeler Stave Company, Benton, Ark., has purchased the Fletcher plant at Rison, Ark., and will install additional machinery. It has also acquired a plant at Pine Bluff whose capacity is to be doubled.

The Ponca City Buff Brick Company, Ponca City, Okla., has been incorporated with a capital stock of $75,000 by C. W. Field, Ponca City, and David Oliver and J. G. Ramsey, Blackwell, Okla.

The Willis Brothers Ice Company, Fairview, Okla., has been incorporated with a capital stock of $15,000 by Thomas E. and W. E. Willis and will install ice-making machinery.

The Farmers' Co-operative Association, Okarche, Okla., will equip a grain elevator of 20,000-bu. capacity. One 25-hp. fuel oil engine will be included.

The Acadia Iron Works, Crowley, La., will install one 25-hp. crude-oil engine, one 25-kw. generator, four 5-hp. motors and two 1-hp. motors.

The New Orleans Railway & Light Company, New Orleans, La., will install street-lighting equipment, including generating equipment, to cost about $160,000.

The New Orleans Corrugated Fiber Box Company, New Orleans, La., has been incorporated with a capital stock of $25,000 by Morris Levy, Max Schwabacher and Julius H. Oppenheim.

Texas

AUSTIN, TEX., Jan. 22, 1916.

The machinery and tool trade continues to hold up well and the sales indicate a gradually growing business. Many new irrigation pumping plants are being installed. The machinery trade with Mexico has fallen off somewhat during the last few days on account of a renewal of disturbed conditions in that country.

The Texas Power Company, Dallas, plans to build a large electric power station at Austin. It will also extend its power transmission system to points south of Waco and Austin.

The Electrolladd Company, San Antonio, has been organized with a capital stock of $50,000 to manufacture electrical machines and appliances. The incorporators are Richard M. Craig, E. N. Phillips and Charles K. Smith.

The Trott Gin Company, Corpus Christi, has been organized with a capital stock of $10,000 to build a cotton gin. Joe Hirsch is in charge.

A special committee of the Texas Cattle Raisers' Association, in conjunction with a similar committee of the American National Live Stock Association, has under consideration plans for the construction of several meat-packing plants in different parts of the country to cost about $10,000,000. J. D. Jackson, Alpine, Tex., is chairman of the joint committee.

San Francisco

SAN FRANCISCO, Jan. 18, 1916.

The shipbuilding industry continues to set the pace in the local machine-tool trade, several new inquiries of considerable importance having come from this source. The occupation of large plants with marine construction, also, has thrown jobbing work largely to the smaller shops, which are now pretty well occupied. Merchants have had very few tools to sell of late, and most orders are for summer delivery. The general machinery trade is hampered by extremely wet weather; but the movement is fair for this season. Lumbermen are beginning to figure on improvements for spring, and pumping machinery receives more attention, as plans are about ready for some important irrigation developments. Cannery equipment is active, and agricultural machinery is in good demand.

Fred Ward & Son, machine tool merchants, who have been at First and Howard Streets for several years, are moving to 164 First Street. The latter location has formerly been occupied by Henry Disston & Sons, who are closing their San Francisco branch and will cover this territory from Seattle.

The Union Gas Engine Company, San Francisco, has received permission to sell 450 shares to its present stockholders at par, $100 per share.

The Union Iron Works, San Francisco, has contracts for the construction of 19 steamers, the total business booked being considered sufficient to keep the works running full, night and day, for two years. The company has just let a contract for a new reinforced concrete foundry building, to cost about $100,000.

The Holt Mfg. Company, Stockton, Cal., has just completed a new addition to its machine shop.

C. C. Barnett and M. P. Haag are equipping a foundry at Oxnard, Cal., and will be prepared to handle iron, brass and aluminum castings.

The American Zinc Company has placed with the Layne & Bowler Corporation, Los Angeles, an order for centrifugal pumps amounting to $35,000.

The Lacy Mfg. Company, Los Angeles, has been awarded a large contract for enlarging the pumping stations of the Associated Oil Company, moving storage tanks, building pipe lines, etc.

The California Canneries Company, this city, is preparing to add three 125-hp. boilers and some canning machinery.

The Island Transportation Company, Stockton, Cal., is starting construction of a shipyard on Banner Island, near Stockton.

The Crowley Launch & Towboat Company has taken out a building permit for a machine shop at the foot of Fourteenth Avenue, Oakland, Cal.

The Pacific Northwest

SEATTLE, Jan. 18, 1916.

General business conditions appear unusually good, despite the fact that the protracted cold siege has tied up a number of lines. Railroad buying of lumber has taken definite shape and orders are now being received. This, too, has served to increase lumber quotations.

The present year will mark a record for Seattle in shipbuilding. Practically every local plant is working to capacity, and the larger ones are increasing their facilities. Approximately $5,000,000 worth of work is now under way. This is a very conservative figure.

An idea of the enormous volume of freight being shipped from Seattle to Vladivostok may be gleaned from the fact that the Great Northern Railroad is holding more than 150 carloads of knocked-down rolling stock and other equipment on its tracks north of this city. This number is augmented daily. The piers are loaded to capacity and every vessel that leaves the port is packed to its limit with cargo.

The Clarke County Iron Works, Portland, Ore., has been incorporated for $15,000 by Charles B. Hirschbuhl, M. Hirschbuhl and Mathew Walch.

The plant of the Stillwater Lumber Company, Vader, Wash., was destroyed by fire recently with a loss of $40,000. It had an output of 100,000 ft. daily. W. E. Brown is manager.

Preliminary plans have been completed for the proposed plant of the Warrenton Clay Company, to be built at Astoria, Ore., for the manufacture of conduits, sewer pipe and kindred clay products. The first unit will cost $70,000. George W. Warren is president and Warren Overpack is general manager.

Construction will begin at once on a shingle mill to be built at Hoquiam, Wash., by the Woodlawn Mill & Boom Company. It will have a capacity of 400,000 shingles in 10 hr. The machines will be individually motor-driven.

The Lewis Speed Governor Company, Salem, Ore., has been incorporated for $25,000 by Arthur H. Devers, Harry B. and H. H. Lewis. It will erect a plant to manufacture governors for cream separators.

The Crescent Box Factory, Bonners Ferry, Idaho, was totally destroyed by fire recently, including the engine and boiler room.

Steusloff Brothers, Salem, Ore., contemplate the construction of a meat-packing plant to cost about $30,000.

Consolidation of the Brookings Timber & Lumber Company and the Owen Lumber Company, both of Brookings, Ore., has been consummated. The new corporation will have capital stock of $5,000,000.

The Fisher Flouring Mills, Seattle, has announced that through its grain department, the Gallatin Valley Milling Company, plans have been completed for twelve elevators of 30,000 bu. each, to be built in Montana. Dan R. Fisher, Ford Building, Great Falls, Mont., is Montana representative.

The Union Stockyards Company, Portland, Ore., will construct additions to its present plant to cost $50,000. Another large scale will be included. W. H. Dougherty is president.

The commercial club, La Grande, Ore., is back of a project to construct a factory for the manufacture of household canning machinery, etc.

Canada

TORONTO, Jan. 22, 1916.

The United Wall Paper Stores Company, Ltd., Toronto, has been incorporated with a capital stock of $10,000 by Charles A. Stone, 17 Laxton Avenue; Elroy B. Schroeder, 41 Quebec Avenue;; H. B. S. Hammond and others to manufacture paper hangers' tools, wall paper, etc.

The Willys-Overland, Ltd., Toronto, has been incorporated with a capital stock of $6,000,000 by James S. Lovell, 25 King Street West; C. Delamere Magee, 300 St. George Street; John J. Dashwood, 25 King Street West, and others. This company was recently amalgamated with the Russell Motor Car Company, West Toronto, and is considering the erection of a factory near the Russell plant to manufacture automobiles, war munitions, etc. T. A. Russell, care of the Russell Motor Car Company, West Toronto, Ont., is vice-president of the Willys-Overland Company.

Bells, Ltd., Grimsby, Ont., has been incorporated with a capital stock of $40,000 by Thomas G. D. Bell, William F. Geddes and others to manufacture iron and steel articles.

The Builders Sales, Ltd., Ottawa, has been incorporated with a capital stock of $100,000 by Edwin P. Nunn, Frederick W. White, Allan T. Lewis and others to manufacture iron, steel, rails, locomotives, tools, cars, machinery, etc.

The Athabasca Power Company, Ltd., Winnipeg, Man., has been incorporated with a capital stock of $100,000 by Robert C. McPherson, Edward W. Lowery, Sidney L. Goldstine and others to operate electric power plants.

The Canada Entertainment Company, Ltd., Montreal, has been incorporated with a capital stock of $100,000 by Archibald J. Laurie, Maurice Rosen, Isidore Greenberg and others to manufacture moving picture machines, films, etc.

The Laurin & Leitch Engineering & Construction Company, Ltd., Montreal, has been incorporated with a capital stock of $100,000 by Arthur Vallee, Arthur R. W. Plimsoll, Adolphe Chouinard and others to manufacture war munitions, shells, building material, etc.

The Automatic Sprinkler Company of America, Ltd., Montreal, has been incorporated with a capital stock of $10,000 by Alexander C. Casgrain, Errold M. McDougall, John B. Henderson and others to manufacture automatic sprinklers, heating and other devices.

The Ross Rifle Company, Quebec, has contracts to give out to manufacturers of small work, such as sewing machines, telephones, phonographs, typewriters, etc.

The premises formerly occupied by the Canadian Cordage Company of Peterborough, Ont., will be taken over and equipped by the Peterborough Metal Products Company.

Wallace, Chapman & Marshall, Oakville, Ont., will establish a factory for the manufacture of boxes, baskets, etc. The town will erect the factory, which will at the end of ten years become the property of Wallace, Chapman & Marshall, providing it has been operated all the time. W. E. M. Crawley is town clerk.

The Canadian Architectural Iron Works, Bellechasse Street, Montreal, were totally destroyed by fire. The machinery will probably be a total loss.

Campbell's Flour Mills, Ltd., West Toronto, Ont., is in the market for a two-phase sixty-cycle 220-volt motor; from 15 to 20 hp.

The sawmill owned by the Riverside Lumber Company, Riverside, Calgary, Alberta, at McGillivray, B. C., which was totally destroyed by fire with a loss of $65,000, will be rebuilt.

The Ottawa Brass Mfg. Company, 367 Wellington Street, Ottawa, will build an addition to its factory.

Calgary, Alberta, is considering the purchase and installation of equipment in the power house to cost $22,500. A. J. Graves is commissioner.

Extensive additions will be made to the power plant of the Lake of the Woods Milling Company, Medicine Hat, Alberta.

Additions will be made to the plant of the Welland Hydro Electric Commission, Welland, Ont., to cost $30,000.

H. E. Ratz & Co., Millbank, Ont., is in the market for a 50 hp. Wheelock or Corliss engine.

The Grand Trunk Railway Company is overhauling its round house at Owen Sound, Ont., and will build a large addition so as to accommodate three more locomotives. It is also building there a dock 1100 ft. long to replace the present one.

The Granite Concrete Block Company and the Norwalk Burial Vault Company have purchased a three-acre site on Weston Road, West Toronto, and will erect a manufacturing plant.

The Manitoba Steel Foundries, Ltd., Winnipeg, has been incorporated with a capital stock of $100,000 by P. J. Smith and others to manufacture machinery, steel, etc.

The Ontario Garage & Motor Sales, Ltd., London, Ont., has been incorporated with a capital stock of $40,000 by William J. Boss, Henry Hayman, William J. Stevenson, and others, to manufacture, assemble, etc., automobile aeroplanes, gasoline engines, etc.

The Frontenac Molding Company, Ltd., Toronto, has been incorporated with a capital stock of $250,000 by John M. Duff, Room 306, 157 Bay Street; Kenneth D. McKenzie, Charles W. Smyth, and others, to manufacture furniture, moldings, frames, etc.

T. M. Michaels and F. J. Burling, Prince Rupert, B. C., plan the construction of a modern wood-working plant in this city. A sawmill will also be erected in the early spring at Port Simpson.

A French cable company in which W. H. Covert is interested will establish a plant at Dartmouth, N. S., for the manufacture of cables.

A Bulletin on Alloy Steels

"The Manufacture and Uses of Alloy Steels" is the title of Bulletin 100 just issued by the United States Bureau of Mines and written by Henry D. Hibbard, consulting engineer, Plainfield, N. J. The object is stated to be to give briefly information of present value relating to the manufacture and uses of the various commercial alloy steels with the hope of stimulating the demand for such steels and extending their practical use. A comprehensive list of definitions of these steels and steels in general is given, and each alloy is ably and concisely discussed. A valuable bibliography is appended at the end of each chapter. The treatment of high-speed tool steels is especially illuminating, and the bulletin is of particular value to one who needs reliable information in condensed form.

Further advance in the development of new alloy steels, says the author in conclusion, as well as many new applications of those alloy steels already established are to be expected. Trials are continually being made of new alloys of promise, some of which will doubtless win a place in the list of useful alloy steels. Hadfield's iron alloy, containing 5 per cent manganese and 15 per cent nickel, although not at present of use, may become so in the future as its properties are rather remarkable.

Handbook for Users of Corkboard Insulation

The Armstrong Cork & Insulation Company, Pittsburgh, Pa., has issued a 151-page catalogue of the standard 6 x 9-in. size. After a brief discussion of the importance of insulation and the requirements of good cold-storage insulation, a description of the company's corkboard which is designed for use in cold-storage warehouses, ice plants, breweries, packing plants, creameries, ice-cream plants, refrigerators, freezing tanks and generally wherever refrigeration is employed or heat-insulating material for temperatures under 212 deg. Fahr. is required is presented. This is followed by an account of the tests made to determine its heat conductivity, and numerous engravings and tables are included. The various features of the insulation, such as non-absorptiveness, freedom from odor, compactness, ease of installation, resistance to fire and low cost, are all commented upon, with illustrations and data from a number of actual cases. The points to be kept in mind regarding insulation for refrigerating plants are discussed at some length, the text being supplemented by illustrations of actual installations and a set of specifications. Mention is also made of a number of purposes aside from its use as a cold-storage insulating material for which this corkboard may be employed.

NEW TRADE PUBLICATIONS

Milling Machines.—Becker Milling Machine Company, Hyde Park, Boston, Mass. Catalog. Size, 8½ x 11 in.; pages, 56. This the company's 1916 catalog describing and illustrating fourteen types and twenty-four sizes of vertical milling machines divided into three groups according to the power of the machine. The special features of the machines are briefly touched upon, followed by a general description, which is supplemented by a number of line and halftone engravings. The various machines are illustrated with an attractive type of engraving having a solid black background to bring out the details of the machine. These engravings are placed on the right-hand pages of the catalog, the left-hand ones being reserved for an exceptionally complete and attractive table of specifications. Mention is also made of the Lincoln, plain horizontal and continuous milling machines, the illustrations of the last being of actual operations. A comparative specification sheet of all of the machines listed is included.

Coal Testing.—Fuel Engineering Company of New York, 106 East Nineteenth Street, New York City. Pamphlet entitled "Matching the Coal to the Plant." Calls attention to the necessity for using fuel that is best suited to the requirements of the plant and points out the importance of having coal properly analyzed before purchases are made. The text of the pamphlet is supplemented by a number of tables giving the results of tests made by this company.

Calendar.—E. Scott Payne Company, 360 North Gay Street, Baltimore, Md. Calendar hanger measuring 16 x 27 in. Aside from the name and address of the firm and a short list of the material handled which includes bar iron and steel, hardware and cutlery, builders' and horseshoers' supplies and automobile accessories, the hanger is practically free from advertising matter. The calendar leaves have easily read figures and contain the dates for three months as well as information regarding the phases of the moon and the number of days that have elapsed since the first of the year.

Automatic Coal and Water Weighers.—Richardson Scale Company, Passaic, N. J. Bulletin No. 101. Lists a line of automatic devices for weighing coal and water in power plants, points out the advantages of using them and describes the construction and operation of the three types that are built. The method of installing the scales is gone into at some length, the text being supplemented by line drawings and halftone engravings of actual installations. Dimension diagrams and tables are included.

Hack Saw Machine.—Massachusetts Saw Works, Springfield, Mass. Pamphlet entitled "Chips from the Victor." This is the thirteenth chip and gives a complete description of a special high-speed hack saw machine for handling all metals up to 9 in. square. After a general description of the construction of the machine, the distinctive features which include a special type of speed adjustment, a shock absorber, extension frame, patent type of vise, automatic lift, rotary pump and automatic stops are dwelt upon at some length, the text being supplemented by engravings of the different features. A general table of specifications of the machine which was illustrated in THE IRON AGE, Sept. 2, 1915, is included.

Combination Bench Filing and Metal Hack-Saw Machine.—Extensive Mfg. Company, 90 West Street, New York City. Circular. Presents a brief description with illustrations of a combination bench filing and metal hack-saw machine designed as a substitute for hand filing and drill work in the making of dies and other particular machine work. The special feature upon which emphasis is laid is the saving in time as compared with the method of drilling and hand filing, and an engraving is presented showing a die which required 50 min. when drilled out and only 18 min. when made on this machine. The files and saws are interchangeable, so that it is possible to change from one to the other readily and universal adjustments are provided for the table to facilitate handling of difficult work.

Automatic Exit Doors.—C. B. Woodard, Springfield, Tenn. Folder. Concerned with an automatic safety exit door which is claimed to prevent persons from being locked in a building and at the same time exclude those who are not provided with a key as the door is unlocked from the outside the same as an ordinary door with a standard night latch key.

Heading and Drawing Presses.—Hydraulic Press Mfg. Company, Mount Gilead, Ohio. Two bulletins. The first, No. 5004, contains a description of a 1000-ton hydraulic press for heading brass cartridge cases after they have been indented. The construction and operation of the press, which was illustrated in THE IRON AGE, Sept. 9, 1915, is supplemented by an engraving of the press. The other bulletin, No. 5005, contains a description of a 800-ton drawing press for producing a cup 17 in. in diameter and 23 in. deep from a ¼-in. steel disk 42 in. in diameter. The descriptive matter is supplemented by an engraving of the press and one showing the various steps in the manufacture of the cups. Specifications of the presses are included in both cases, together with a partial list of the work that can be done by the presses of the company.

Automatic Tapping and Countersinking Machine.—Poese Machinery & Mfg. Company, Cleveland, Ohio. Folder. Deals with an automatic bench tapping and countersinking machine which was illustrated in THE IRON AGE, Sept. 2, 1915. As the name indicates the machines are designed for tapping either blind or through holes up to ¼ in. in diameter to the required depth and then reversing and backing out without the use of hand or foot levers. Emphasis is laid upon the fact that this machine gives the operator free use of both hands for the work and eliminates the countershaft and extra belts as it is self-contained. An engraving of the machine with the various parts numbered to correspond with the directions given for operating it is presented together with a condensed table of specifications.

Concrete Industrial Building.—Turner Construction Company, 11 Broadway, New York City. Booklet entitled "Turner for Concrete." Tells about the organization that has been developed for the construction of reinforced concrete industrial buildings and the way in which it works. The story starts with the preparation of plans and continues through the entire construction of the building until it is completed. Supplementing the text are views of a number of buildings that have been built with a brief statement of the size and the time required for construction. The contracts illustrated include factories, loft buildings, warehouses, etc. In the book a list of some of the firms for whom more than one contract has been executed is given, together with the number of contracts for each.

Taps and Dies.—Winter Bros. Company, Wrentham, Mass. Catalog No. 11. Treats of a line of carbon and high-speed steel taps and dies. The tools covered include hand, nut, machine screw, tapper, pulley, hob, pipe and stove and stay bolt taps, tap wrenches, die stocks, square and spring screw threading dies and screw plates, and the finding of any particular section of the catalog is facilitated by the use of a thumb index. In each of the sections an illustration of the particular tool covered is presented with a brief description of it and a table of the sizes in which it can be supplied.

Testing Machines for Cylindrical Gas Containers.—Watson-Stillman Company, 190 Fulton Street, New York City. Catalog No. 93 superseding No. 76. Illustrates and describes a machine for testing cylindrical gas containers that is made in both screw and hydraulic types, the former for laboratory use or where a machine of small capacity is required, while the latter is used for large capacity. A discussion of the various methods of testing the cylinders and the safety disks with which they must be equipped is included, the text being supplemented by a number of line drawings showing the arrangement of the apparatus. Results of tests made with the smaller size of machine are presented, a series of curves being employed to supplement the data secured.

Tool Holder.—Rigid Tool Holder Company, Baltimore, Md. Pamphlet. Relates to a boring tool system comprising three types of independent holders which can be supplied in five sizes, a tool post holder made in seven sizes and ten sizes of boring bars. The arrangement of the various types of tool holders is illustrated and brief descriptions of the special work for which they may be used included. Tables of the sizes in which the various members of the system which was illustrated in THE IRON AGE, Sept. 2, 1915, can be secured are given.

Oil Engines.—De La Vergne Machine Company, Foot of East 138th Street, New York City. Two calendar hangers measuring 9 x 11 in. The greater portion of the hangers is given to illustrations of two different types of oil engines with a brief statement of the daily fuel cost. The calendar pads are of the three-month variety with current month in the center and the preceding and succeeding months on either side.

Graphite Products.—Joseph Dixon Crucible Company, Jersey City, N. J. Pamphlet. Points out the advantages of using a line of graphite products as lubricants in either the flake or grease form, as a preventive of boiler scale, for dressing belts, painting metal and wood surfaces, for brushes in electrical machinery and in foundries for crucibles and facings. Most all of the products have the form in which they are sold illustrated with a brief table of the sizes that can be supplied. Mention is also made of a line of lead pencils and colored crayons.